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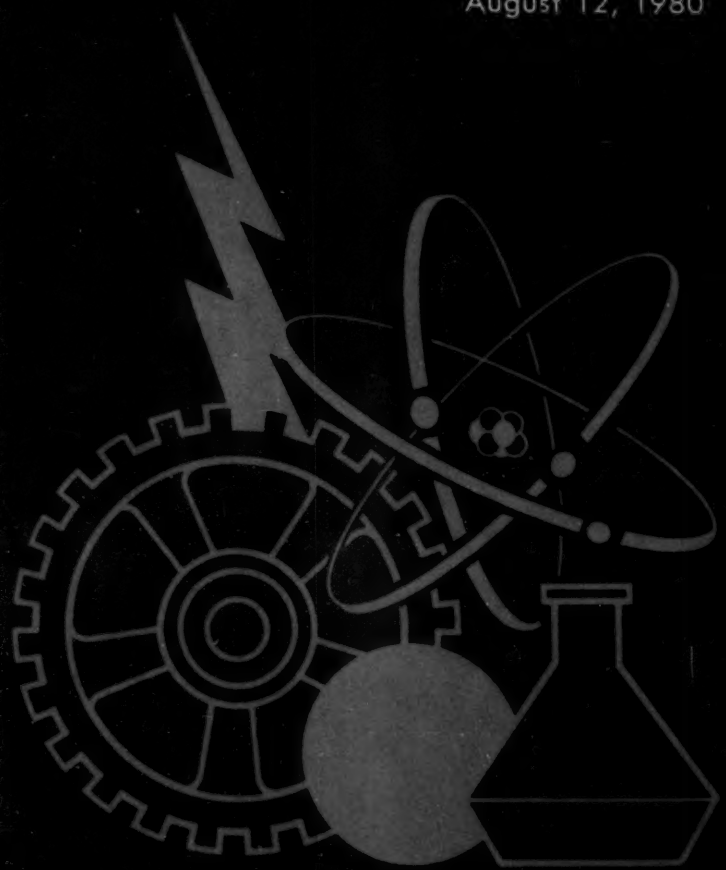
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 12, 1980



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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 12, 1980 Volume 997 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

June 17, 1980.

Report on Results of a July, 1979 Survey on the Citation by Applicants of Prior Art in Patent Applications

This report summarizes the data compiled from a sample of 900 allowed applications surveyed in the Office of Patent Program Control during the week of July 16 to July 19, 1979.

All applications in this survey were filed on or after July 1, 1977, the effective date of the establishment of new rules 37 CFR 1.97–1.99 relating to the citation of prior art by applicants.

For the purposes of the survey, a "citation", whether appearing in the specification or in a separate paper, is defined as (1) a listing of patents or publications together *with* a concise explanation of the relevance of each listed item (i.e. a prior art "statement" under 37 CFR 1.98 (a)) or (2) a "mere listing" of patents or publications. In addition, a "reference" is defined as any patent or other publication cited by applicant.

This survey is similar to and presented in the same general format as the surveys published in the OFFICIAL GAZETTE of November 23, 1976, pages 1356 and 1357 and of September 26, 1978, pages 22 and 23.

This survey indicates, among other things, that 63% of the sampled applications include citations by applicants. This is generally consistent with the 64% finding in the 1978 survey and, like the 1978 survey, represents an improvement over the 54% finding in the 1976 survey.

The statistics are otherwise presented without comment as follows:

	Chem.	Elec.	Mech.	Total
(1) Number of applications in sample	300	300	300	900
(Percent of total)	33	33	33	100
Number of applications having citations submitted in:				
(2) Separate papers only	83	60	71	214
(Percent of sample 2/1)	28	20	24	24
(3) Both separate papers *and* in specification	10	14	9	33
(Percent of sample 3/1)	3	5	3	4
(4) The specification only	85	109	125	319
(Percent of sample 4/1)	28	36	42	35
(5) Total number of applications having citations	178	183	205	566
(Percent of sample 5/1)	59	61	68	63

Applications in which the applicant submitted citations in the *specification*.

	Chem.	Elec.	Mech.	Total
(6) Number of applications including citations in the specification	95	123	134	352
(Percent of applications having citations 6/1)	32	41	45	39

Applications in which the applicant submitted citations in the *specification*.

	Chem.	Elec.	Mech.	Total
(7) Number of applications including mere listing of references in the specification	9	9	4	22
(Percent of applications having mere listing of references 7/1)	3	3	1	2
(8) Number of applications including prior art statements in the specification	86	114	130	330
(Percent of applications having prior art statements 8/1)	29	38	43	37
(9) Number of applications including prior art statements in the specification which included copies of the references	26	35	29	90
(Percent of applications, with statements, having copies of references 9/8)	30	31	22	27
(10) Number of applications having prior art statements in the specification which comply fully with the guidelines (37 CFR 1.97–1.99; MPEP § 900) (e.g. timely filed, translations where applicable, etc.)	28	30	25	83
(Percent of applications, with statements, in accordance with CFR and MPEP 10/8)	33	26	19	25
(11) Number of applications having prior art statements citing non-English documents in specification	23	20	19	62
(Percent of applications, with statements, citing non-English documents 11/8)	27	18	15	19
(12) Number of applications having prior art statements citing non-English documents in specification which included an English translation or English equivalent document	4	5	3	12
(Percent of applications, with statements, having translations of non-English documents 12/11)	17	25	16	19

Applications in which applicant submitted citations in *separate papers*.

	Chem.	Elec.	Mech.	Total
(13) Number of applications having citations in a separate paper	93	74	80	247
(Percent of applications having citations in separate papers 13/1)	31	25	27	27
(14) Number of separate papers having citations. (Note that 253 papers were filed in 247 applications. Of 247 applications, 241 had one paper and 6 applications had two papers)	95	77	81	253
(15) Number of separate papers having citations submitted within 3 months of the filing date of the application	68	47	61	176
(Percent of separate papers having citations submitted within 3 months 15/14)	72	61	75	70
Number of separate papers having citations filed later than 3 months after the filing date and after the first Office action which:				
(16) Included a statement explaining why the prior art was not earlier presented	2	3	3	8
(Percent of separate papers having citations including explanations for late filing 16/14)	2	4	4	3
(17) *Did not include* a statement explaining why the prior art was not earlier presented	25	27	17	69
(Percent of separate papers having citations not including explanation for late filing 17/14)	26	35	21	27

Applications in which applicant submitted citations in *separate papers.*

	Chem.	Elec.	Mech.	Total
(18) Number of separate papers having citations which included a copy(s) of the reference(s)	72	56	62	190
(Percent of separate papers having citations including copy(s) of the reference(s) 18/14)	76	73	77	75
(19) Number of separate papers having citations which included a non-English document citation	20	10	22	52
(Percent of separate papers having citations citing non-English documents 19/14)	21	13	27	21
(20) Number of separate papers having citations which included an English translation or English language equivalent of a non-English document	13	3	8	24
(Percent of separate papers having translation etc., of non-English documents 20/19)	65	30	36	46
(21) Number of separate papers having prior art statements	88	51	62	201
(Percent of separate papers having prior art statements 21/14)	93	66	77	79
(22) Number of separate papers having citations which fully conformed with the guidelines (37 CFR 1.97–1.99; MPEP § 609)	56	30	37	123
(Percent of separate papers fully conforming with CFR and MPEP 22/14)	59	39	46	49

Applications (With Statements in Specification) Grouped Below According to Numbers of References Cited.

	Chem.	Elec.	Mech.	Total
(23) Numbers of applications including statements in the specification having a range of 1–5 references	66	98	108	272
(Percent of applications having statements in specification with 1–5 references 23/8)	77	86	83	82
(24) Number of applications including statements in the specification having a range of 6–10 references	15	10	20	45
(Percent of applications having prior art statements in specification with 6–10 references 24/8)	17	9	15	14
(25) Number of applications including statements in the specification having more than 10 references	5	6	2	13
(Percent of applications having statements in specification with 10 or more references 25/8)	6	5	2	4

Separate Papers (With Statements) Grouped Below According to Numbers of References Cited.

	Chem.	Elec.	Mech.	Total
(26) Number of separate papers including statements having a range of 1–5 references	47	28	34	109
(Percent of separate papers with 1–5 references 26/21)	53	55	55	54
(27) Number of separate papers including statements having a range of 6–10 references	20	14	19	53
(Percent of separate papers with 6–10 references 27/21)	23	27	31	26
(28) Number of separate papers including statements having more than 10 references	21	9	9	39
(Percent of separate papers with 10 or more references 28/21)	24	18	14	20

Applications (With Mere Listings of References in Specification and Separate Papers) Grouped Below According to Number of References Cited.

	Chem.	Elec.	Mech.	Total
(29) Number of applications having a range of 1–5 references	7	18	9	34
(Percent of applications having listings of 1–5 references 29/29+30+31)	47	55	39	48
(30) Number of applications having a range of 6–10 references	6	10	4	20
(Percent of applications having listings of 6–10 references 30/29+30+31)	40	30	17	28
(31) Number of applications having more than 10 references	2	5	10	17
(Percent of applications having listings of 10 or more references 31/29+30+31)	13	15	44	24

July 14, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Removal From Register

Pursuant to the provisions of 37 C.F.R. 1.347, a letter was directed on November 30, 1979, to Mr. Joseph A. Finlayson, Jr., at 3847 Branch Ave., Iverson Mall, Hillcrest Heights, Md., 20031, the last post office address furnished by him to the Committee on Enrollment. No reply was received within the period of thirty days therein set. Accordingly, his name is being removed from the Register of Attorneys.

July 15, 1980.

LUTRELLE F. PARKER,
Chairman, Committee on Enrollment.

New System To Monitor Patent Applications

During this summer the Patent and Trademark Office will begin implementation of a new office-wide computer system, the Patent Application Locator and Monitor System (PALM 3), for monitoring the location and status of pending patent applications. The system will also have the ability to print data on certain form letters such as the Notice of Allowance, using computer-controlled printers located in the Examining Groups. This will permit the Notice of Allowance to be printed and mailed by the Groups shortly after the Examiner has decided that an application is in condition for allowance. Under the new system, the Notice of Allowance will be mailed prior to completion of final issue revision by the Group clerical staff. In those applications where an Examiner's Amendment is required, it will normally be mailed as an attachment to the Notice of Allowance.

When existing printing backlogs have been eliminated, this accelerated mailing should reduce the time between allowance by the examiner and issuance of the patent grant in most cases. The nature and/or extent of the revisions or processing requirements subsequent to mailing of the Notice of Allowance may result in little or no reduction in the time required for the printing of a few patents. In addition, it is possible that, as a result of this additional processing, withdrawal or correction of the Notice for a given application may be required. For instance, prosecution might be reopened as a result of the Quality Review Program. In situations where the Base Issue Fee has been paid and the Notice of Allowance is subsequently withdrawn, the applicant may request that a refund be made or that the fee be credited to a Deposit Account.

Applicants will continue to receive a three part Notice of Allowance packet, but, as a result of automated printing, the Notice will be produced in a slightly revised format. This new format will have the following application data printed thereon:

—Serial Number
—Filing Date
—Total Claims Allowed
—Date of Mailing
—Examiner Name and Group Art Unit
—First Named Applicant
—Title of the Invention

—Base Issue Fee Due (Utility Applications Only)
—Attorney's Docket Number
—Class and Subclass Where Issued

Copy (a) of the new Notice of Allowance will be used as applicant's record copy in the current manner. Copy (b) will continue to be used as a transmittal for the fee with copy (c) required when a charge to a deposit account is authorized. The new version of copy (c) will also have a section to notify the Office of a change in an inventor's address. Note that this address change need not be signed by the inventor. This procedure eliminates the need for the separate Inventor's Address Change form (PTOL–231) now in use.

One other change to current practice will also be implemented as a result of the new system. Beginning with patents issuing in the late fall of this year, advance orders for patent copies will only be sent to the correspondence address of record in the application. This practice will permit computer generation of mailing labels for the orders and thereby eliminate the need for the separate, pink Advance Order form (PTO–721) now in use. Requests for advance orders will now be made in a special section of copy (b) of the Notice of Allowance. During the transition from the old order method to the new, it will be necessary to send some advance orders to the correspondence address of record in the application rather than some other address as has been requested on an earlier submitted Advance Order Form.

While the major impacts on the public will be limited to those discussed above, one other minor matter should be mentioned. It is anticipated that, due to the absence of data in the master data base, some information occasionally may not be printed on the Notice of Allowance or on other form correspondence. However, this does not necessarily mean that a corrected Notice or form letter is required. Furthermore, since the data base is not used for printing of the patent grant, the missing information should appear on the final issued patent if it is in the application file wrapper. This problem is expected to diminish as the implementation of the system proceeds and the data base becomes more complete. The cooperation of applicants and their representatives during this system implementation is sincerely appreciated by the Patent and Trademark Office.

SIDNEY A. DIAMOND,
Approved: June 16, 1980. *Commissioner of Patents and Trademarks.*

Entry Into Force of the Budapest Treaty

The Patent and Trademark Office announces the entry into force on Aug. 19, 1980 of the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure with respect to the United States, Hungary, Bulgaria, France and Japan. A copy of the Treaty was published in the Official Gazette on Aug. 23, 1977 (961 O.G. 21–36).

Following entry into force of the Treaty, each State adhering or acceding thereto will be authorized to nominate depositories on its territory to serve as international depository authorities. Upon compliance with certain procedural steps set forth in the Treaty, each such depository will be designated an international depository authority.

No depository in the United States or elsewhere has yet been nominated or designated to serve as an international depository authority. It is expected, however, that some depositories will shortly be designated both in the United States and other States adhering to the Treaty. Public notice will be provided of the designation of each international depository authority and its requirements for patent deposits.

An application for a patent in any adhering States involving the action of a microorganism, for which a deposit is required, may make the required deposit in any international depository authority. The fact and date of making the deposit will be recognized for all patent purposes in each State adhering to the Treaty. No further deposit will be required for national patent processing or enforcement, provided a deposit is properly made under the provisions of the Treaty.

An application for a United States patent will not be required to proceed under the provisions of the Budapest Treaty, however. Such an applicant may rely instead on a deposit made in any depository meeting the requirements set forth in *In re Argoudelis et al.*, 168 USPQ 99 (CCPA, 1970) and reprinted in section 608.01(p), Manual of Patent Examining Procedure.

Questions or information regarding the Budapest Treaty may be directed to the Office of Legislation and International Affairs, at the following address: Box 4, Commissioner of Patents and Trademarks, Washington, D.C. 20231. The telephone number of the Office of Legislation and International Affairs is (703) 557–3065.

SIDNEY A. DIAMOND,
Date: July 14, 1980. *Commissioner of Patents and Trademarks.*

JORDAN J. BARUCH,
Date: July 16, 1980. *Assistant Secretary for Productivity, Technology and Innovation.*

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,031,788, Melvin L. Shannon, **FISHING TACKLE; 3,628,274,** Charles P. Wojahn, **TEMPERATURE-SENSING SYSTEM FOR PLACEMENT OF FISHING LURES, filed** Apr. 21, 1976, D.C., W.D. Mich. (Grand Rapids), Doc. G–76–204Ca6, *R.D.T., Inc., doing business as Rivier Marine & Tackle Co. v. Jack King, doing business as King Industries and Luhr Jensen & Sons.* Defendants are perpetually enjoined from making, using, selling and offering for sale apparatus coming within the scope of said Patent. Filed May 12, 1980.

3,047,196, Bernard Plastics Molding Corp., **GARMENT HANGER, filed** Oct. 6, 1978, U.S. Court of Appeals (2nd Cir., N.Y.), Doc. 78–7473, *Warbern Packaging Industries, Inc. v. Out Rate Plastic Hangers, Inc.* Order withdrawing appeals filed on Dec. 12, 1978. **Same, filed** June 22, 1972, D.C. Mass. (Boston), Doc. 72–1974–LC, *Bernard Plastics Molding Corp. v. Ray State Plastic Corp.* Defendant is permanently enjoined against infringing plaintiff's patent. Filed Apr. 25, 1974.

3,063,457, Scholl, Inc., **FOOT EXERCISER SANDELS, filed** Sept. 12, 1978, D.C., N.D. Ill. (Chicago), Doc. 74c2302, *Scholl, Inc. v. S. S. Kresge Company.* Judgment in favor of defendant regarding motion for review of the taxation of costs filed on Sept 6, 1979.

3,521,719, Rhino Industries, **MOTOR VEHICLE, filed** June 5, 1980, D.C. Minn. (Minneapolis), Doc. 6–80–349, *Dynamic Industries, Inc. v. Rhino Industries.*

3,628,274. (See 3,031,788.)

3,732,808, Polychrome Corp., **APPARATUS FOR DEVELOPING OFFSET PRINTING PLATES, filed** June 6, 1980, D.C., S.D.N.Y., Doc. 80–C–3228, *Pluribus Products, Inc. v. Polychrome Corp.* **Same, filed** June 18, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c3161, *Polychrome Corporation v. Freundorfer, Incorporated.*

3,738,217, Omark Industries Inc., **INSULATION HANGER, filed** June 11, 1980, D.C.N.J. (Trenton), Doc. 80–1743, *Omark Industries Inc. v. Erico Products, Inc.*

3,868,670, Joseph O'Nory, **CUSTOMER SERVICE DISPLAY, filed** June 18, 1980, D.C., W.D. Wash. (Seattle), Doc. C–80–668V, *Joseph O'Nory et al. v. Tycor Manufacturing Inc. et al.*

3,907,332, Donald G. Richardson, **SUSPENSION SYSTEM, filed** June 17, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–02589, *Suzuki Motor Co., Ltd. et al. v. Donald G. Richardson.*

3,911,868, Chore-Time Equipment, Inc., **POULTRY FEEDER, filed** May 23, 1980, D.C. Tenn. (Chattanooga), Doc. 1–80–137, *Chore-Time Equipment, Inc. v. Cumberland Corporation.*

3,996,158, Marvin D. Cohen, **PUMICITE FILTER AID, filed** June 20, 1980, D.C., S.D. Tex. (Houston), Doc. H–80–1376, *Oil Process Systems, Inc. v. Clarid Co. and Marvin D. Cohen.*

4,044,474, Edwin R. Greene and Rodney F. Greene, **ANIMAL DRYER: Re. 30,266,** same, **filed** May 22, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–02174, *Rodney F. Greene and Edwin R. Greene v. The Rea Company, doing business as The Rea Company/Edemco et al.*

4,070,973, Jerome Morgan, **MECHANIZED DISPLAY DEVICE, filed** May 29, 1980, D.C., E.D. Mich. (Detroit), Doc. 80–72017, *Jerome Morgan v. Conglo Enterprises, Inc. et al.*

4,121,891, Guy W. Barron, TAPE PLAYER CLEANING DEVICE, **filed** May 22, 1980, D.C., S.D. Miss. (Jackson), Doc. J–80–0234(N), *Guy W. Barron* v. *Radio Shack.*

4,179,753, Aronberg and Fein, HEADGEAR WITH EYEGLASS SUPPORT, **filed** June 13, 1980, D.C., S.D.N.Y., Doc. 80–C–3372 CBM, *Sport Eyes, Inc.* v. *Commodore Corp. et al.*

4,199,606, Bobby J. Bland, PROPIONIC ACID ON A CARRIER MATERIAL AS A PRESERVATIVE, **filed** May 22, 1980, D.C., N.D. Ga. (Atlanta), Doc. C–80–886A, *Anitox Corporation and Bobby J. Bland* v. *New South Manufacturing Co. et al.*

4,207,851, Charles J. Crisefi, EMERGENCY IGNITION FOR INTERNAL COMBUSTION ENGINES, **filed** May 29, 1980, D.C., M.D. Fla. (Tampa), Doc. 80–633–CIV–T–GC, *E-vitro-tronics, Inc.* v. *Charles Crisefi.*

Re. 30,266. (See 4,044,474.)

D. 215,876, Henry Linke, SCRUBBER, **filed** June 20, 1980, D.C., N. Dak. (Bismarck), Doc. A4–80–81, *Henry Linke* v. *F. W. Woolworth Co.*

D. 245,626, Hardee's Food Systems, Inc., BUILDING FOR FAST FOOD RESTAURANT OR THE LIKE, **filed** June 19, 1980, D.C. Ohio (Akron), Doc. C–80–1046A, *Hardee's Food Systems, Inc.* v. *Robert G. Simpson et al.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 235,701, Re. S.N. 155,195, Filed Jun. 2, 1980, Cl. D00, SHOE SOLE, Joseph P. Famolare, Jr., Owner of Record: *Famolare, Inc., New York, N.Y.,* Attorney or Agent: Hubert T. Mandeville, et al., Ex. Gp.: 290

3,664,619, Re. S.N. 153,799, Filed May 27, 1980, Cl. 248/051, CHAIN FOR SUPPORTING ENERGY CONVEYING MEANS, AND CHAIN LINK THEREFOR, Klaus Heidrich, et al., Owner of Record: *Kabelschlepp Gesellschaft mit Beschrankter Haftung, Siegen, Germany,* Attorney or Agent: Martin A. Farber, Ex. Gp.: 355

3,936,956, Re. S.N. 155,181, Filed Jun. 2, 1980, Cl. 36/32 R, REFLEX ACTION SOLE FOR SHOES HAVING SINUOUS CONTOURED BOTTOM SURFACE, Joseph P. Famolare, Jr., Owner of Record: *Famolare, Inc., New York, N.Y.,* Attorney or Agent: Hubert T. Mandeville, et al., Ex. Gp.: 353

3,951,765, Re. S.N. 152,505, Filed May 22, 1980, Cl. 204/96, PRODUCTION OF ELECTROLYTIC BATTERY ACTIVE MANAGANESE DIOXIDE, Peter Kenneth Everett, Owner of Record: *Inventor,* Attorney or Agent: Bruce L. Adams, Ex. Gp.: 114

4,084,747, Re. S.N. 140,444, Filed Apr. 17, 1980, Cl. 239/4, GERM-KILLING COMPOSITION AND METHOD, Howard Alliger, Owner of Record: *Inventor,* Attorney or Agent: Roy C. Hopgood, Ex. Gp.: 313

4,092,011, Re. S.N. 154,272, Filed May 29, 1980, Cl. 254/8 C, LIFT MECHANISM FOR A TRUCK, Ralph C. Luebke, Owner of Record: *Moore & Sons, Inc., Memphis, Tenn.,* Attorney or Agent: William E. Dominick, et al., Ex. Gp.: 323

4,092,589, Re. S.N. 154,151, Filed May 28, 1980, Cl. 324/73 R, HIGH SPEED TESTING CIRCUIT, Yuk B. Chau, et al., Owner of Record: *Fairchild Camera and Instrument Corporation, Mountain View, Calif.,* Attorney or Agent: Alan H. MacPherson, et al., Ex. Gp.: 252

4,119,005, Re. S.N. 116,583, Filed Jan. 29, 1980, Cl. 84/1.01, SYSTEM FOR GENERATING TONE SOURCE WAVESHAPES, Michio Kondo, et al., Owner of Record: *Inventors,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,120,212, Re. S.N. 154,647, Filed May 30, 1980, Cl. 74/476, FORWARD-REVERSE INTERLOCK FOR A TRANSMISSION, R. Dale Philipsen, Owner of Record: *Caterpillar Tractor Company, Peoria, Ill.,* Attorney or Agent: Paul S. Lempio, et al., Ex. Gp.: 352

4,153,776, Re. S.N. 155,711, Filed Jun. 2, 1980, Cl. 528/49, AMIDE-MODIFIED URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS AND COATING COMPOSITIONS AND METHODS OF MAKING SAME, Charles B. Friedlander, et al., Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: George D. Morris, Ex. Gp.: 144

4,154,634, Re. S.N. 142,456, Filed Apr. 21, 1980, Cl. 156/180, METHOD FOR FABRICATING IMPROVED FIBER REINFORCED PLASTIC RODS HAVING A SMOOTH SURFACE, Samuel M. Shobert, et al., Owner of Record: *Plas/Steel Products, Inc., Walkerton, Ind.,* Attorney or Agent: George A. Gust, et al., Ex. Gp.: 161

4,178,826, Re. S.N. 154,992, Filed May 30, 1980, Cl. 84/1.26, ENVELOPE GENERATOR, Teruo Hiyoshi, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,179,972, Re. S.N. 154,994, Filed May 30, 1980, Cl. 84/1.11, TONE WAVE GENERATOR IN ELECTRONIC MUSICAL INSTRUMENT, Teruo Hiyoshi, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,183,275, Re. S.N. 154,767, Filed May 30, 1980, Cl. 84/1.01, ELECTRONIC MUSICAL INSTRUMENT, Koji Niimi, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,185,532, Re. S.N. 154,993, Filed May 30, 1980, Cl. 84/1.26, ENVELOPE GENERATOR, Teruo Hiyoshi, et al., Owner of Record: *Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

PATENT NOTICES

Certificates of Correction for the Week of Aug. 12, 1980

Re. 30,001	4,180,858	4,196,563	4,201,900
3,431,085	4,181,098	4,197,048	4,202,257
3,972,898	4,181,283	4,197,248	4,202,564
4,009,696	4,181,669	4,197,792	4,202,734
4,046,962	4,183,062	4,197,886	4,203,021
4,078,229	4,186,004	4,198,117	4,203,204
4,089,925	4,186,224	4,198,193	4,203,273
4,105,548	4,187,033	4,198,208	4,203,507
4,109,088	4,187,111	4,198,412	4,203,766
4,109,909	4,187,295	4,198,417	4,203,774
4,127,583	4,187,359	4,198,422	4,203,861
4,137,227	4,187,471	4,198,428	4,203,925
4,137,233	4,188,253	4,198,708	4,204,004
4,142,036	4,189,326	4,198,964	4,204,084
4,142,582	4,190,495	4,199,021	4,204,141
4,150,061	4,190,773	4,199,052	4,204,144
4,151,843	4,191,597	4,199,079	4,204,173
4,155,957	4,191,698	4,199,263	4,204,268
4,162,994	4,191,917	4,199,323	4,204,409
4,163,380	4,193,474	4,199,330	4,204,457
4,164,095	4,193,774	4,199,484	4,204,575
4,164,243	4,193,795	4,199,505	4,204,938
4,165,411	4,194,011	4,199,586	4,205,092
4,166,172	4,194,018	4,199,609	4,205,115
4,167,766	4,194,068	4,200,276	4,205,295
4,168,736	4,194,109	4,200,461	4,205,325
4,174,012	4,194,274	4,200,506	4,205,861
4,175,153	4,194,392	4,200,762	4,206,116
4,175,257	4,194,897	4,200,919	4,206,156
4,175,441	4,194,922	4,200,990	4,206,547
4,175,976	4,194,980	4,201,284	5,206,547
4,177,135	4,195,013	4,201,476	4,206,638
4,177,155	4,195,083	4,201,588	4,206,669
4,178,291	4,195,317	4,201,667	4,206,816
4,179,540	4,195,320	4,201,669	4,206,889
4,179,612	4,195,458	4,201,715	4,206,926
			4,209,581
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National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

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DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6-090,385. Simplified Electrical Feedthrough System for Pressurized Containers. Filed Nov. 1, 1979.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent 4,147,590. Nuclear Propulsion Apparatus With Alternate Reactor Segments. Filed Sept. 1, 1965. Patented Apr. 3, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6-034,887. Signal Generator. Filed Apr. 30, 1979.

Patent application 6-048,878. Mass-Transport Separator for Alkaline Nickel-Zinc Cells. Filed June 15, 1979.

Patent application 6-057,612. Room Temperature Two Color Infrared Detector. Filed July 13, 1979.

Patent application 6-070,073. Production of Antibody Toward Asbestos. Filed Aug. 27, 1979.

Patent application 6-070,204. Signal Generator. Filed Aug. 27, 1979.

Patent application 6-070,239. Multi-Layer Ram Air Parachute Canopy. Filed Aug. 27, 1979.

Patent application 6-071,886. Rubber Boot Expander. Filed Sept. 4, 1979.

Patent application 6-072,399. Normally Off InP Field Effect Transistor. Filed Sept. 4, 1979.

Patent application 6-076,033. Optical Lithographic Method for Fabrication of Submicron Wide Lines. Filed Sept. 17, 1979.

Patent application 6-076,057. Automatic Focusing System. Filed Sept. 17, 1979.

Patent application 6-076,896. Pivotable Cable Guard for Retaining a Swingable-Movable Cable. Filed Sept. 19, 1979.

Patent application 6-079,729. Ammunition Separator Tray. Filed Sept. 28, 1979.

Patent application 6-080,761. Stabilizer. Filed Oct. 1, 1979.

Patent application 6-080,846. Single Crystal Thin Films. Filed Oct. 1, 1979.

Patent application 6-082,504. A Transient Suppression Connector. Filed Oct. 3, 1979.

Patent application 6-083,044. An Ultrasonic Image System. Filed Oct. 4, 1979.

Patent application 6-088,264. Telescopic Launch and Retrieval Chute. Filed Oct. 25, 1979.

Patent application 6-088,494. Integral Store Suspension and Communication Device. Filed Oct. 26, 1979.

Patent application 6-088,498. Motor Drive. Filed Oct. 26, 1979.

Patent application 6-088,904. High Acceleration Protective Seat. Filed Oct. 29, 1979.

Patent application 6-090,787. Automatic Particle Analyzing System. Filed Nov. 2, 1979.

Patent application 6-090,834. Self Compressing Supersonic Flow Device. Filed Nov. 1, 1979.

Patent application 6-091,286. Inhibitor for Gun Propellants. Filed Dec. 5, 1979.

Patent application 6-092,298. A Staircase Electrode-Wall Configuration for MHD Generators. Filed Nov. 5, 1979.

Patent application 6-092,819. Submersible Energy Storage Apparatus. Filed Nov. 9, 1979.

Patent application 6-093,483. Quick Disconnect Cap Having Pressure Venting Means. Filed Nov. 9, 1979.

Patent application 6-093,790. Charging Mechanisms for Electrogasdynamic Spectral Anemometer. Filed Nov. 7, 1979.

Patent application 6-095,111. Magnetic Flip-Flop for Hydrophone Preamplifier. Filed Nov. 16, 1979.

Patent application 6-095,683. Solid State Laser and Material. Filed Nov. 19, 1979.

Patent application 6-095,869. Optical Gain Control Device. Filed Nov. 19, 1979.

Patent application 6-097,028. Power Frequency Converter. Filed Nov. 21, 1979.

Patent application 6-097,269. Mooring System. Filed Nov. 21, 1979.

Patent application 6-099,053. Solid Compositions for Generation Fluorine and Gaseous Fluorine Compounds. Filed Nov. 30, 1979.

Patent application 6–099,355. Spinning Tubular Projectile Combustible Sabot. Filed Dec. 3, 1979.

Patent application 6–099,380. Low-Power Electromagnetic Flowmeter. Filed Dec. 3, 1979.

Patent application 6–101,029. Modulation Analysis Apparatus. Filed Dec. 6, 1979.

Patent application 6–101,312. Index-Matched Fused-Cladding Single Mode Bi-Directional Fiber Optic Access Coupler/Beamsplitter. Filed Dec. 7, 1979.

Patent application 6–102,293. Acetylene-Terminated Dianil Monomer and the Polymer Therefrom. Filed Dec. 10, 1979.

Patent application 6–102,701. Self-Restricting Shutoff Valve. Filed Dec. 12, 1979.

Patent application 6–104,511. A Holographic Optical Article and Process. Filed Dec. 17, 1979.

Patent application 6–104,521. Pilot Helmet Mounted CIG Display With Eye Coupled Area of Interest. Filed Dec. 17, 1979.

Patent application 6–105,176. Rifle Recoil Simulator. Filed Dec. 19, 1979.

Patent application 6–105,313. Electro-Optic Infantry Weapons Trainer. Filed Dec. 19, 1979.

Patent application 6–105,315. Method of Producing a Plaque Dispersing Enzyme. Filed Dec. 19, 1979.

Patent application 6–110,076. Thermal Battery Cells Utilizing Molten Nitrates as the Electrolyte and Oxidizer. Filed Jan. 7, 1980.

Patent application 6–111,443. Electrooptically Balanced Alternating Delta Beta Switch. Filed Jan. 11, 1980.

Patent application 6–113,426. Equi-Visibility Lighting Control System. Filed Jan. 18, 1980.

Patent application 6–113,875. Programmer Bootstrap Loading System. Filed Jan. 18, 1980.

Patent application 6–113,917. Hydrophone Deployment Apparatus for an Underwater Vehicle. Filed Jan. 21, 1980.

Patent application 6–114,780. Discrete Amplitude Shading for Lobe Suppression in Discrete Array. Filed Jan. 24, 1980.

Patent application 889,576. High Resolution Quantizer. Filed Mar. 23, 1978.

Patent application 916,423. Solid Compositions for Generation of Gases Containing a High Percentage of Hydrogen or Its Isotopes. Filed June 16, 1979.

Patent application 929,595. Semi-Active Optical Fusing. Filed July 31, 1978.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA Code GP–2, Washington, D.C. 20546

Patent application 6–098,567. Precision Reciprocating Filament Chopper. Filed Nov. 29, 1979.

Patent application 6–098,569. Multi-Channel Temperature Measurement Amplification System. Filed Nov. 29, 1979.

Patent application 6–098,570. Solar Energy Control System. Filed Nov. 29, 1979.

Patent application 6–111,436. Magnetic Field Control. Filed Jan. 11, 1980.

Patent application 6–115,536. Smoothing Filter for Digital to Analog Conversion. Filed Jan. 25, 1980.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
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	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
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Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-2-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-3-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	12-20-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-9-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	8-8-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-21-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	6-7-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-7-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,095,572 to 3,099,836, inclusive
Plant Patents ..... Numbers 2,269 to 2,270, inclusive

REISSUES

AUGUST 12, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,364

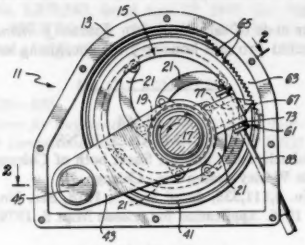
VARIABLE SPEED TRANSMISSION

Trevor L. Harris, Costa Mesa, Calif., assignor to Harris Dynamics, Costa Mesa, Calif.

Original No. 3,892,139, dated Jul. 1, 1975, Ser. No. 468,412, May 9, 1974. Application for reissue May 8, 1978, Ser. No. 904,004

Int. Cl.[2] F16H *29/04*

U.S. Cl. 74—116 **24 Claims**



1. A variable speed transmission comprising:

first and second rotatable members;

first mounting means for mounting said first [and second] rotatable [members] *member* for rotation about *a* first [and second] rotational [axes, respectively] *axis;*

second mounting means for mounting said second rotatable member for rotation about a second rotational axis;

at least one drive element;

first means for drivingly coupling the drive element to the first rotatable member;

second means for drivingly coupling the drive element to the second rotatable member at a predetermined location;

said first means including one-way clutch means mounted on and substantially circumscribing the first rotatable member for providing a driving connection between said drive element and the first rotatable member in one direction about said first rotational axis and to allow the first rotatable member to rotate about said first rotational axis in the opposite direction whereby one of said rotatable members can drive the other of said rotatable members;

the rotation of said second rotatable member causing said predetermined location to circumscribe a region, said first rotational axis extending through said region; [and]

at least one of said mounting means including means for allowing adjustment in the relative radial position of said rotational axes whereby the drive ratio between said members can be varied*; and*

said first mounting means supporting said first rotatable member on one side of said one-way clutch means and said first rotatable member being unsupported on the other side of said one-way clutch means and radially inwardly of said one-way clutch.

Re. 30,365

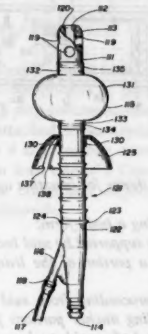
DISPOSABLE CATHETER

Martin Mattler, 24575 Franklin Park Dr., Franklin, Mich. 48025

Original No. 3,896,816, dated Jul. 29, 1975, Ser. No. 360,363, May 14, 1973. Continuation-in-part of Ser. No. 139,725, May 3, 1971, abandoned. Application for reissue Apr. 29, 1976, Ser. No. 681,511

Int. Cl.[2] A61M *25/00*

U.S. Cl. 128—349 B **3 Claims**



2. A catheter comprising:

an elongated hollow tube having a forward end and a rearward end, the forward end being provided with a plurality of apertures to facilitate fluid delivery to a body cavity;

a first opening in the tube wall proximate the forward end thereof;

a sealing cuff mounted upon the tube over the area including the first opening, the sealing cuff comprising a thin walled, air impervious, resilient rubber-like material;

the tube extending through the cuff and the cuff end portion being sealed to the tube such that the cuff may be inflated to an enlarged ring-shape co-axial with the tube for sealing a body cavity within which the tube is inserted;

a second opening in the tube wall near the rearward end thereof;

means disposed within the tube for interconnecting the first and second openings;

said sealing cuff comprising a cuff central portion with integral, co-axially aligned, short, opposite cylindrically-shaped cuff end portions;

upon deflation of said sealing cuff, the circumference of said cuff central portion of said sealing cuff is only slightly greater than the circumference of the major portion of said elongated hollow tube;

said sealing cuff has at least one fold therein which inverts when said sealing cuff is inflated to permit the relatively small diameter uninflated sealing cuff to expand to a substantial inflated diameter;

a rearwardly and outwardly curved shield mounted below the cuff for sealing the body cavity, the shield including a central opening and having a hub portion through which the tube is fitted;

means for mounting the shield on the tube, the mounting means including an elongated slot provided through the shield and a coupling means for closing the slot; and wherein

the openings and the means for interconnecting the openings cooperate to define an air inlet for flowing pressurized air into and for discharging air from the cuff to inflate and

deflate, respectively, the cuff after the tube is inserted into the body cavity.

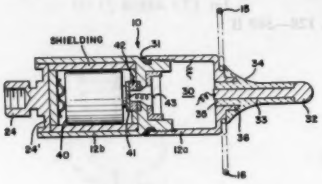
Re. 30,366
ORGAN STIMULATOR

Ned S. Rasor, Sunnyvale, Calif., and Joseph W. Spickler, Lakewood, Colo., assignors to Rasor Associates, Inc., Sunnyvale, Calif.

Original No. 3,835,864, dated Sep. 17, 1974, Ser. No. 73,809, Sep. 21, 1970. Application for reissue Sep. 15, 1976, Ser. No. 723,635

Int. Cl.[3] **A61N** *1/36*

U.S. Cl. 128—419 P **13 Claims**



8. A stimulator device for insertion against a portion of a living body, comprising:

a structure having a body form;

electrode means supported by said body form for non-attaching contact with a portion of the living body to be stimulated thereby; and

anchor means proceeding from said body form, said anchor means including anchor portions for location in a position in said living body, said anchor portions providing means for piercing and thereby engaging in said position of said living body, said anchor means including means for mounting said anchor portions to project outwardly of said body form and away from all portions of said electrode means for preventing formation of significant non-excitable tissue such as fibrotic tissue adjacent to said electrode means due to irritation of said living body caused by said anchor means to establish said electrode means in a required position of use, said electrode means having in connection therewith means to energize the same one said body form is located in its required position of use.

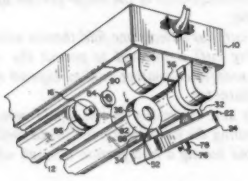
Re. 30,367
POWER TAKE-OFF FOR FLUORESCENT LIGHT FIXTURES

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

Original No. 3,989,335, dated Nov. 2, 1976, Ser. No. 507,807, Sep. 20, 1974. Application for reissue Oct. 25, 1978, Ser. No. 954,562

Int. Cl.[3] **H01R** *33/08*

U.S. Cl. 339—50 R **17 Claims**



1. A power take-off unit for a [dual tube] fluorescent fixture wherein the adjacent ends of [the] laterally spaced tubes and their associated protruding conductor pins receive electrical power by electrical contact with fixture terminals *and* are used for delivering electrical power to a foreign load, comprising:

[an electrically insulated] *a* housing member adapted to accommodate said foreign [electrical] load;

a pair of spaced conductor members having end portions and extending from said housing member with the length of the [connection and] *conductor members including* end portions substantially less than the length of one of said tubes;

each of said [conductor] end portions including *an* electrically conductive disc [portions] *portion* adapted to detachably engage in electrical contact with *one of* said conductor pins at said adjacent ends to utilize voltage differential between the electrical potentials supplied separately to the pins of adjacent tube ends by the generating ends of their ballasts; and

a layer of insulating [plastic] *material* on at least one side of each disc *portion* having a flange portion protectively enclosing the marginal edge portions of the disc *portion* and of a diameter approximately that of the end of [the] *a* tube,

the other ends of said conductor [means] *members* being connected [to said housing] for energizing said foreign load.

Re. 30,368
GAS-PERMEABLE LENS

Samuel Loshaek, and Chah M. Shen, both of Chicago, Ill., assignors to Wesley-Jessen Inc., Chicago, Ill.

Original No. 4,111,535, dated Sep. 5, 1978, Ser. No. 731,675, Oct. 12, 1976. Application for reissue Mar. 5, 1979, Ser. No. 17,430

Int. Cl.[3] **G02C** *7/04*

U.S. Cl. 351—160 H **10 Claims**

1. A transparent optically clear gas-permeable contact lens consisting essentially of a plasticized cellulose resin selected from a partially esterified or partially etherified cellulose polymer plasticized with a compatible plasticizer in an amount sufficient to increase the oxygen permeability of the cellulose resin at least about 13% higher than that of the unplasticized cellulose resin but below that at which the optical and physical properties of the lens are substantially adversely affected.

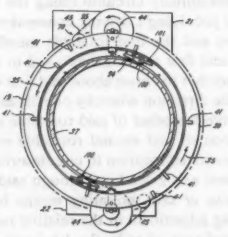
Re. 30,369
PIPE WRAPPING APPARATUS

Daniel F. Wilson, Houston, Tex., assignor to Midcon Pipeline Equipment Co., Houston, Tex.

Original No. 4,058,427, dated Nov. 15, 1977, Ser. No. 755,261, Dec. 29, 1976. Application for reissue Jan. 5, 1979, Ser. No. 1,077

Int. Cl.[2] **B65H** *81/00*

U.S. Cl. 156—392 **12 Claims**



15. Pipe wrapping apparatus, comprising first spindle means adapted to hold a roll of pipe wrapping tape having a strip of backing material removably adhered to one surface thereof, means for supporting said first spindle means adjacent a pipe receiving path provided through said pipe wrapping apparatus, means for

moving said supporting means and said first spindle means about a pipe disposed along said path to draw said tape from said roll to be wound around said pipe, second spindle means supported by said supporting means adjacent said first spindle means, means for rotating said second spindle means about its axis whereby said backing strip may be wound thereon and removed from said pipe wrapping tape before said pipe wrapping tape is wound around said pipe, and including pressure roller means for pressing said tape against the outer surface of the pipe, said pressure roller means being supported by said supporting means adjacent a pipe in said path and being supported by a frame spring biased toward said pipe.

Re. 30,370

FLAVORING FOODSTUFFS WITH A THIOESTER

Alan O. Pittet, Atlantic Highlands; Denis E. Hruza, Bricktown; Ira Katz, Elberon; Cynthia J. Mussinan, Bricktown, and John V. Pascale, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Original No. 3,879,562, dated Apr. 22, 1975, Ser. No. 314,381, Dec. 12, 1972. Division of Ser. No. 195,829, Nov. 4, 1971, abandoned. Application for reissue Jan. 16, 1979, Ser. No. 3,882

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—535 **7 Claims**

9. A process for augmenting or enhancing the flavor of a foodstuff which comprises adding thereto from about 0.005 ppm up to about 40 ppm of a thioester selected from the group consisting of allylthiobenzoate, propylthiobenzoate, methyl-3-(methylthio) thiopropionate, propylthiopropionate, allylthiopropionate, and cyclopentylthiopropionate.

Re. 30,371

CATALYTIC PROCESS FOR IMIDE-ALCOHOL CONDENSATION

Ross M. Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Original No. 3,922,254, dated Nov. 25, 1975, Ser. No. 490,439, Jul. 22, 1974. Application for reissue Mar. 5, 1979, Ser. No. 17,745

Int. Cl.[2] C08G *69/16*

U.S. Cl. 528—312 **24 Claims**

1. A catalyzed imide-alcohol condensation process for the preparation of polymeric compounds of polyester-polyamide comprising: [contacting] *polymerizing* alcohols having one or more hydroxyl groups attached to an aliphatic carbon, and acyl lactams *having from 4 to 11 carbon atoms in each lactam ring,* in the presence of at least one of a Group IA, IIA, IIB, and IIIA metal or metal compound *to form said polymeric compounds of polyester-polyamide.*

PLANT PATENTS

GRANTED AUGUST 12, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,587

APPLE TREE (ACE STRAIN)

Carl R. Perleberg, P.O. Box 838, Quincy, Wash. 98848

Filed Oct. 19, 1978, Ser. No. 952,641

Int. Cl.[2] A04L *5/00*

U.S. Cl. Plt.—35 **1 Claim**

1. The new and distinct spur variety of Red Delicious apple tree characterized particularly, as contrasted with other spur varieties of Red Delicious apple trees, by the relatively large size of its interior spur leaves indicative of superior vigor and ability to support large, high quality fruit over long periods of time; by the early development of the red color of its fruit; by the uniformity of the red color on the front and back sides of its fruit; by the large size and deep red but bright color of its fruit; by the high color factor consistency of its fruit; and by the loss of chlorophyll in the flesh and underlayer of the epidermis of its fruit at an early date, substantially as shown and described.

PATENTS

GRANTED AUG. 12, 1980

ERRATA

For CLASS	See PATENT NO.
433–009	4,216,583
156–466	4,216,638
368–028	4,216,646
368–245	4,216,647
368–066	4,216,648
368–109	4,216,649
368–072	4,216,650
474–012	4,216,678
474–238	4,216,679
072–063	4,216,703
410–064	4,216,726
440–061	4,216,737
401–044	4,217,062
430–320	4,217,168
556–419	4,217,294
568–477	4,217,309
526–068	4,217,431
526–119	4,217,432
371–068	4,217,486
455–612	4,217,488
455–081	4,217,549
455–001	4,217,550
375–088	4,217,551
455–164	4,217,552
367–037	4,217,571

PATENTS

GRANTED AUG. 12, 1980

ERRATA

PATENTS

GRANTED AUGUST 12, 1980

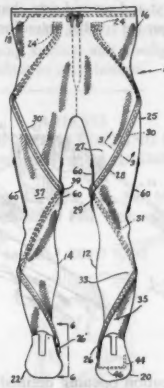
GENERAL AND MECHANICAL

4,216,547

INJURY PROTECTION DEVICE FOR ATHLETES

P. Vincent Picchione, 968 Avenida Olivos, Palm Springs, Calif. 92262

Filed Feb. 2, 1979, Ser. No. 9,156
Int. Cl.² A41D *13/06*
U.S. Cl. 2—22 **16 Claims**



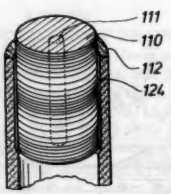
1. Apparatus for use in preventing athletic injury, which comprises cable means comprising a flexible nonelastic cable having first and second ends and adapted to extend between the hip area and foot area of a user by being wrapped at least one full turn about the leg beginning at said hip area and ending at said foor area, means for securing said cable at its first end in said hip area and at its second end in said foot area, and guide means extending about said leg for housing said cable.

4,216,548

LONG-TERM ENDOPROSTHESIS

Werner Kraus, 41 Augustenstrasse, Munich, Fed. Rep. of Germany

Division of Ser. No. 779,127, Mar. 18, 1977. This application May 30, 1979, Ser. No. 43,776
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611744
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **5 Claims**



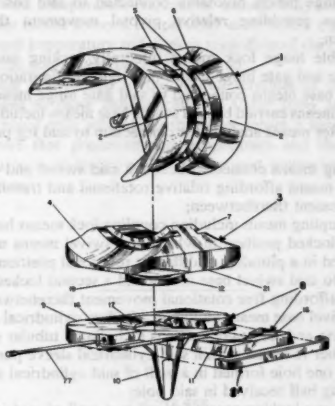
1. A long-term endoprosthesis comprising, in combination, a body member for implanting in the bone of a person, said body member having an outer surface configured for intimate contact with the bone in which said body member is implanted, a conductor wound on said body member having turns disposed in closely spaced relationship within the major portion of the area of contact between said body member outer surface and the bone, said conductor having opposite ends connected together and means for coupling said conductor to a low frequency magnetic field to produce an electromotive force in said wound conductor resulting in a voltage difference between the turns of said wound conductor, at least some of the turns of said wound conductor being adapted to form electrodes for enhancing the growth of new bone in said area of contact.

4,216,549

SEMI-STABLE TOTAL KNEE PROSTHESIS

Benny M. Hillberry, West Lafayette, and Donald B. Kettelkamp, Carmel, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation-in-part of Ser. No. 802,780, Jun. 2, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,616
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 **7 Claims**



1. A prosthetic knee joint comprising:

two pairs of coacting male and female load bearing condylar elements, one of said pairs being carried by a first component,

another of said pairs being carried by a second component;

the male elements each including a spheroidal protuberance and an arcuate rib;

the female elements each including a spheroidal socket adapted to coact with the correspondingly shaped male component, and each female element also including an arcuate groove adapted to receive said arcuate rib so that front to back rotational motion is permitted between the male elements and the female elements but front to back linear motion and side to side rotatable motion therebetween is substantially constrained;

said second component including a flat load transmission plate;

a third component including platform load bearing means adapted to support the load transmission plate of said second component;

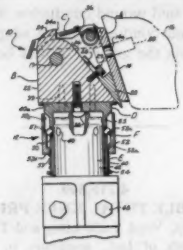
said third component also including connection means adapted to engage said second component so that rotation therebetween in a direction about the normal axis of an extended leg is permitted.

4,216,550

HIP JOINT MECHANISM

Johnnie W. Thompson, Rte. 3, Box 263, Pelzer, S.C. 29669

Filed Nov. 3, 1978, Ser. No. 957,466
Int. Cl.³ A61F *1/08*
U.S. Cl. 3—15 **5 Claims**



1. A hip joint mechanism for adapting a leg prosthesis to a body adapter of the user of the prosthesis comprising:

base hinge means adapted for connection to said body adapter;

gate hinge means pivotably connected to said base hinge means providing relative pivotal movement therebetween;

releasable hinge lock means integrally locking said base hinge and gate hinge means in a rigid configuration;

swivel base means connected to said gate hinge means;

swivel means carried by said swivel base means including leg adapter means adapted for connection to said leg prosthesis;

coupling means connected between said swivel and swivel base means affording relative rotational and translational movement therebetween;

said coupling means including coupling lock means having a first locked position in which said swivel means may be locked in a plurality of different rotational positions relative to said swivel base means and a second locked position affording free rotational movement therebetween;

said swivel base means including a hollow cylindrical sleeve portion and said swivel means including a tubular swivel member received within said cylindrical sleeve portion;

at least one hole formed in a wall of said cylindrical sleeve;

a locking ball received in said hole;

at least one locking recess formed in a wall of said tubular swivel member receiving said locking ball to provide a first locked position;

an annular lock nut slidably received about said cylindrical sleeve retaining said locking ball including means for biasing said locking ball in said locking position; and

said biasing means of said annular lock nut including a first surface engaging said locking balls in said locking position, said annular lock nut including a second surface defining a space between said lock nut and said cylindrical sleeve in which said locking balls are retained when said annular lock nut is in an interlocking position wherein said locking balls are disengaged from said locking recess.

4,216,551

SHAMPOO APPARATUS

Edward J. Pasquarello, 5 Silvermine Rd., Woburn, Mass. 01801

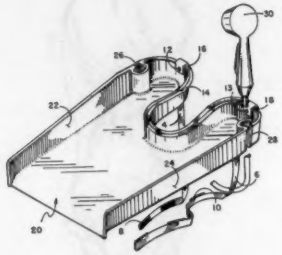
Filed Feb. 5, 1979, Ser. No. 9,102
Int. Cl.² A45D *19/00*; A47K *3/12*; A61H *35/00*
U.S. Cl. 4—521 **1 Claim**

1. An improved shampoo tray device of the type having a tray, a neck receiving aperture, and side ridges, which tray is adapted to be affixed to the individual being shampooed, wherein the improvement comprises:

a first and second side channel formed within the tray and extending along the sides of said neck receiving aperture formed by said raised side ridges extending along the edges of said tray and around said neck receiving aperture;

seal means positioned around said neck receiving aperture adapted for water-tight contact of said tray to the individual's neck;

a first and second retention strap affixed to said first side channel and said second side channel, respectively, said first and second retention straps each having a plurality of retention means comprised of hook and loop materials along the length thereof, said first and second retention straps being affixed around both the edge of the tray at the ends of said first and second side channels and the ends of said seal member for further retention of said seal member to said tray;



a spray head retention opening defined in the side of each channel, each adapted for holding a water spray device;

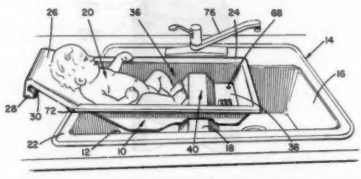
said shampoo tray adapted for use by positioning said neck receiving aperture of said tray at the rear of the neck of the individual being shampood and positioning the other end of said tray over means for water drainage, extending said first retention strap over the shoulder of the individual and then around and under the arm on the side of the retention strap and around the back of the individual, extending said second retention strap over the shoulder of the individual and then around and under the arm on the side of the retention strap and around the back of the individual, and affixing said first and second retention straps together behind the individual.

4,216,552

SINK MOUNTED INFANT BATHING DEVICE

Richard C. Gurolnick, Arlington Heights, Ill., assignor to Product Source Inc., Laguna Hills, Calif.

Filed Jan. 25, 1979, Ser. No. 3,342
Int. Cl.² A47K *3/024*
U.S. Cl. 4—548 **8 Claims**



1. A unitary device for infant bathing, said device being configured for use on a double basin kitchen sink having a raised partition between the basins; said device comprising:

substantially peripheral ridge means defining a top opening;

a first trough portion generally configured and contoured for receiving the body of an infant therein, said first trough portion including an upwardly extending back and head supporting surface extending above the plane of said opening;

a second trough portion adjacent the end of said device opposite said supporting surface, said second trough portion having a shallower depth than said first trough portion; and

a divider portion between said first and second trough portions, one end of said ridge means and the undersurface of said divider portion adjacent said back and head supporting surface being configured and dimensioned for setting said device over a double basin sink with said one end of the ridge means resting on an edge region of the sink and the undersurface at the divider portion resting on and being retained in position by the partition of said sink; said first trough portion includes horizontally disposed ledge means mating, with said divider portion generally opposite said supporting surface and configured for enabling the feet of the infant to rest thereon.

4,216,553

TOILET WITH FOLDING LID

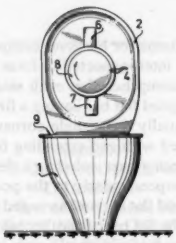
Walter Haberle, Gronauer Weg 16, D-6368 Bad Vilbel, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,355

Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721433

Int. Cl.[3] E03D *9/00*

U.S. Cl. 4—300 **13 Claims**



1. A toilet comprising a bowl, a toilet seat, a flushing device for flushing said bowl, and a foldable lid linked to said seat, which includes: a spraying device connected to the bottom side of said lid for spray-flushing the interior of said bowl after the latter has been flushed by said flushing device, and conduit means connected to said spraying device for conveying spray water thereto, cleaning means arranged on said lid and associated with a cleaning device for cleaning said toilet seat, the spraying device including a rotatable section provided with outlets for cleaning said toilet bowl.

4,216,554

AUTOMATIC FREEZE-PROOF DRAIN SYSTEM

Albert J. Glueckert, Skokie; Robert J. Honegger, Lake Zurich; Everett E. Nylund, Hoffman Estates, and Philip A. Saigh, Morton Grove, all of Ill., assignors to Gard, Inc., Niles, Ill.

Filed Feb. 12, 1979, Ser. No. 11,505

Int. Cl.[3] B61D *35/00;* **E03D** *9/10, 9/12*

U.S. Cl. 4—323 **12 Claims**

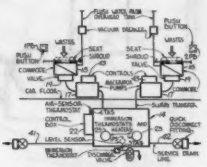
1. A system to control the operation by a battery, that is connected by a battery to an AC power source, of power-operated drain valve means having first and second terminals that when exclusively signalled operate the valve means to open and close, respectively, its valve connected to the low end of piping connected to a higher tank containing liquid, said system comprising:

temperature-responsive means having a first terminal connectable to one terminal of the battery, and second and third terminals connectable exclusively to the first and second terminals, respectively, of the valve means; and

power-responsive means connectable to the AC power source, connected to the battery charger, and connected to said temperature-responsive means,

said temperature-responsive means and said power responsive means being constructed and operatively connected to each other in a manner so that, when said temperature-responsive means is connected to the battery and to the first and second terminals of the power-operated valve means and said power-responsive means is connected to the AC power source,

a signal is provided to the first terminal of the valve means to open automatically its valve from said second terminal



of said temperature-responsive means, only when the latter means senses a temperature at or below a predetermined temperature and does so regardless of the condition of the power-responsive means, and

a signal is provided to the second terminal of the valve means to close automatically its valve from said third terminal only when both the latter senses a temperature above that predetermined temperature and the power source is on to provide power to said power-responsive means.

4,216,555

DUAL FLUSH SYSTEM

Edgar W. Detjen, Mueller Rd., Rte. 2, Kiel, Wis. 53042

Filed Feb. 8, 1979, Ser. No. 10,341

Int. Cl.[2] E03D *1/14, 3/12*

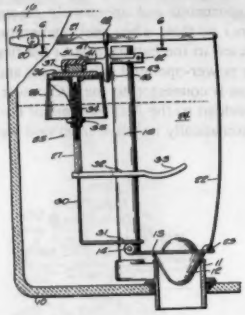
U.S. Cl. 4—324 **11 Claims**

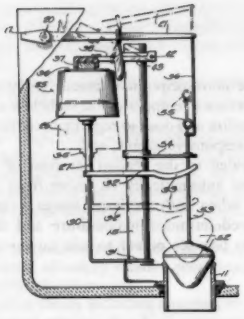
1. In a flush tank having an outlet with a valve seat, a buoyant flush ball valve for said outlet seat, a flush trip handle, a link between the flush ball and handle for lifting the flush ball off of the outlet seat, a buoyant flush ball reseating weight and guide means on which said reseating weight rises and falls with the level of liquid in the tank, said reseating weight prematurely closing the flush ball against its outlet seat to effectuate a partial flush when the reseating weight is allowed to float downwardly with the falling level of liquid in the tank, the improvement for actuating the flush ball reseating weight comprising:

(a) a movable member that is movable in response to tripping of said trip handle and is in magnetically coupled relation with said reseating weight for attracting and latching it in its uppermost position and holding it against downward movement toward the flush ball when the trip handle is momentarily tripped, whereby to produce a full flush,

(b) mainintaining said trip handle in tripped condition for longer than momentarily such as for a few seconds permitting said weight to float down with the falling level of

liquid in the tank a sufficient amount to effect magnetic uncoupling of said member and weight for enabling said





weight to continue to float down and reseat the flush ball, whereby to produce a partial flush.

4,216,556

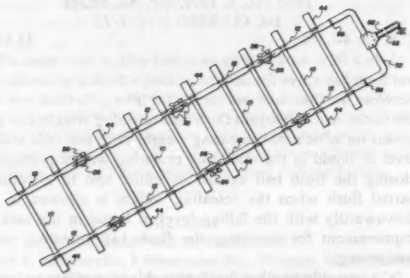
EXTRICATION SPLINT FOR ACCIDENT VICTIMS

John D. Haeussinger, 9566 Halberns Blvd., Santee, Calif. 92071

Filed Oct. 10, 1978, Ser. No. 950,132

Int. Cl.[2] A61G *7/10*

U.S. Cl. 5—82 R **7 Claims**



1. An extrication splint for injury victims comprising:

(a) a pair of spaced siderails each being provided in at least two jointed segments and the joints connecting said segments having means to rigidly fix same at any one of several angles;

(b) a plurality of cross-bars separate from said siderails;

(c) means to releasibly mount said cross-bars to and between said siderails to support a victim's body thereon and

(d) a plurality of longitudinally spaced handles projecting laterally from each side of said splint.

4,216,557

HONEYCOMB FRAME FOR BEEHIVES

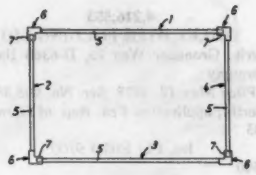
Hans-Dieter Golde, Frankfurt, Fed. Rep. of Germany, assignor to Stapla Hans-Dieter Golde GmbH & Co KG, Rossbach v.D.H., Fed. Rep. of Germany

Filed Oct. 2, 1978, Ser. No. 947,455

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1978, 2744741

Int. Cl.[3] A01K *47/02*

U.S. Cl. 6—10 **14 Claims**



1. Honeycomb frame for beehives comprising a plurality of sectional members interconnected to form the frame, wherein the improvement comprises that each said sectional member comprises an elongated flat bar having a first end and a second end, and a substantially right angle corner part integrally secured to and aligned with and extending from the first end of said flat bar, said corner part including a sleeve portion extending substantially perpendicularly to the portion of said corner part aligned with said flat bar and arranged to receive and hold the second end of the flat bar of another said sectional member, each said flat bar and corner part has an inner surface facing into the interior of the frame and an oppositely facing outer surface, said flat bar has a continuous groove in the inner surface thereof extending in the elongated direction of said flat bar and said corner part has a groove in the inner surface thereof in the portion aligned with said flat bar and forming a continuation of the groove in said flat bar and a slot formed in the inner surface of said sleeve portion with said slot forming a continuation of the groove in said flat bar and said corner part, each said corner part has a pair of spaced side surfaces extending between the inner and outer surfaces thereof and each of said side surfaces having a spacer surface thereon projecting outwardly from said side surface.

4,216,558

WATER INLET ADAPTER VALVE FOR BOATS

Gary W. Schultz, 1132 La Salle Ave., Niagara Falls, N.Y. 14301

Filed Sep. 13, 1978, Ser. No. 941,959

Int. Cl.[3] B63B *17/00*

U.S. Cl. 9—1.1 **5 Claims**

1. A water inlet adapter valve body for boats comprising:

a hollow cylindrical valve body having two ends;

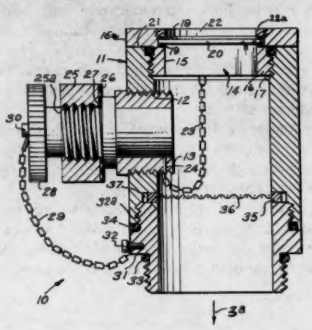
a cap threadedly secured in one end of said hollow cylindrical valve body, said cap having an inspection glass fixed therein;

an insert sleeve threadedly secured to the other end of said hollow cylindrical valve body, said insert sleeve being adapted to secure said hollow cylindrical valve body to a boat;

a fitting threaded in a side of said hollow cylindrical valve

body, said fitting adapted to connect a hose to said hollow cylindrical valve body;

a plug for closing said fitting; and



a screen secured between an end of said insert sleeve and an internal shoulder of said hollow cylindrical valve body.

4,216,559

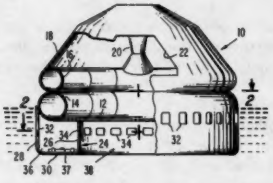
LIFE RAFT HAVING A TOROIDAL WATER BALLAST CHAMBER

Richard Switlik, Jr., Box 1328, Trenton, N.J.

Filed Feb. 2, 1978, Ser. No. 874,181

Int. Cl.[2] B63C 9/04

U.S. Cl. 9—11 R **6 Claims**



1. In a life raft of the type including a floor and a flotation element extending about and joined to the periphery of the floor, the improvement comprising a water ballast chamber that extends about the periphery of the floor in parallel, underlying relation to the flotation element, and that in cooperation with the floor defines a center space wholly open at its bottom and closed at its top by the floor, said ballast chamber defining about said center space a side wall structure that is substantially continuous over the full periphery of the floor and that in cooperation with the floor imparts to the center space an inverted cup shape, the side wall structure formed by the ballast chamber comprising flexible inner and outer side walls each of which has a series of water flow ports circumferentially spaced about the ballast chamber, and comprising additionally a flexible bottom wall closing the chamber at its bottom over the full extent thereof, whereby water entering the chamber through the ports will be retained mainly within an area underlying the flotation element and extending about the open center space, over substantially the full periphery of the floor.

4,216,560

DEBURRING APPARATUS

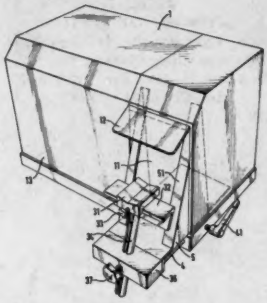
Rainer Schmidt, Rosmart 30, 5990 Altena 4, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,702

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 7717764[U]; Jul. 28, 1977, 7723581[U]

Int. Cl.[3] A46B 13/02

U.S. Cl. 15—21 D **3 Claims**



1. In an apparatus for deburring workpieces such as profiles, tubes, metal sheets or the like of the type including a housing and a deburring tool rotatably mounted within the housing about a horizontal axis such that the tool partially projects from the housing, the improvement comprising:

a workpiece holder located in front of said housing for holding said workpiece to be deburred level with and in abutment with said rotatable tool, said holder including a block portion;

workpiece retaining means mounted on said block portion so as to be displaceable upwardly at an oblique angle to the periphery of said tool, said workpiece retaining means including a holder portion; and

means for displacing said block portion and said workpiece retaining means into said housing in a direction towards said tool, said means for displacing said block portion and said workpiece retaining means comprising a horizontal bar guide slidable into the housing, said block portion being mounted on said bar guide.

4,216,561

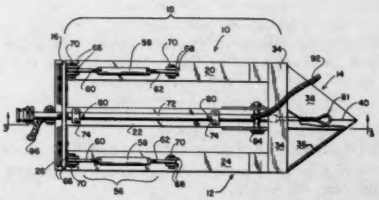
IMPLEMENT FOR CLEANING BOX CULVERTS

Jack R. Clifford, 1817 State St., Alton, Ill. 62002

Filed Apr. 3, 1979, Ser. No. 26,806

Int. Cl.[2] B08B 9/02

U.S. Cl. 15—104.3 R **10 Claims**



1. An implement for cleaning box culverts and other drains and waterways having a rectangular cross section, said implement comprising a body with means for plowing at its forward end and plunging means at its rearward end, said means for plowing directing material plowed loose by said plowing means upwardly and backwardly as well as laterally outwardly towards said plunging means, said implement further including

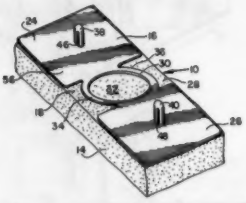
a first water directing means for spraying water in advance of said plowing means and a second water directing means for simultaneously spraying water behind said plowing means but in advance of said plunging means, whereby any dirt clogging the culvert or the like is prewetted by said first water directing means before it is plowed loose and is further wetted by said second water directing means before it is swept forward by said plunging means.

4,216,562

SPONGE MOP REFILL

Martin P. Strahs, Lawrenceville, N.J., assignor to Quickie Manufacturing Corporation, Cinnaminson, N.J.

Filed Oct. 31, 1978, Ser. No. 956,432
Int. Cl.³ A47L 13/257
U.S. Cl. 15—119 A **6 Claims**



1. In a sponge refill assembly suitable for use with a sponge mop, the combination of

a body of cellulosic sponge material suitable to retain a quantity of water therewithin, said body comprising an exterior surface;

a unitary backing strip applied to the body at the said exterior surface,

said backing strip being fabricated of relatively thin, stiff, hard material,

said backing strip being securely affixed to the body surface,

the backing strip comprising a pair of spaced press feet, the press feet being separated by a weakened, medial cut out area whereby the refill assembly can be medially folded by bending the backing strip at the weakened area,

the medial cut out area comprising an integral, thin web interconnecting the press feet, the said web being adapted to be bent when the refill assembly is folded, and a cut out open area intermediate the press feet and adjacent to the web, the open area being greater in area than the area of the thin web, and

fastening means retained by the backing strip,

said fastening means comprising a shank portion extending from the backing strip in a direction away from the body,

said shank portion including means adaptable to releasably secure the sponge refill assembly to to a sponge mop,

whereby the refill assembly can be medially folded by bending the backing strip thin web to squeeze the sponge material for water extraction purposes.

4,216,563

COMBINED DRY AND WET CARPET CLEANER

Gilbert G. Cyphert, Glendale, Ariz., assignor to Chemko Industries, Inc., Phoenix, Ariz.

Filed Apr. 6, 1979, Ser. No. 27,789
Int. Cl.³ A47L 7/00
U.S. Cl. 15—321 **12 Claims**

1. A dual function carpet cleaner for dry and wet cleaning of a carpet, said carpet cleaner comprising in combination:

(a) a base unit for supporting either of two interchangeable debris collecting containers, one of said containers being used with said base unit for dry cleaning and another of said containers being used with said base unit for wet cleaning, said base unit including:

i. a source of vacuum for establishing an air flow;

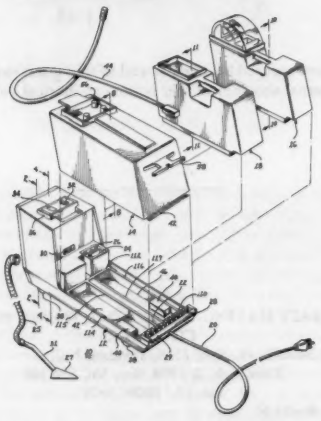
ii. an inlet in fluid communication with said source of vacuum and ambient air for establishing an air flow path to said source of vacuum;

iii. a vacuum hose and attached vacuum head connectable to said base unit for receiving and channeling debris into said base unit; and

iv. an outlet in fluid communication with said vacuum hose for discharging any debris received by and channeled through said vacuum hose;

(b) said one container comprising:

i. an housing in fluid communication with and disposed intermediate said inlet and said outlet for conveying air flow from said outlet through said housing and into said inlet in response to said source of vacuum;



ii. a filter disposed within said housing, said filter being in interfering relationship with the air flow through said housing for filtering debris from the air flowing from said vacuum hose, through said outlet and into said housing;

(c) said other container comprising:

i. a first container for containing a cleaning solution to be discharged onto the carpet being cleaned;

ii. a second container in fluid communication with and disposed intermediate said inlet and said outlet for collecting a mixture of cleaning solution and debris drawn through said outlet into said second container in response to the air flow to said source of vacuum through said inlet from said vacuum hose in fluid communication with said outlet;

whereby, said base unit is useable with either said one or said other of said interchangeable containers to dry or wet clean, respectively, a carpet.

4,216,564

DRAPERY HANGER

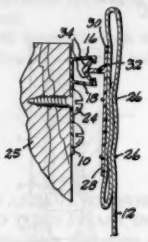
Andrew Froutzis, 54532 Glenwood Park Dr., Elkhart, Ind. 46514

Filed Mar. 8, 1979, Ser. No. 18,777
Int. Cl.² A47H 13/12
U.S. Cl. 16—93 D **7 Claims**

1. In the combination of a drapery hanger adapted to be secured to a support and a drape detachably and slidably suspended from the hanger, wherein the hanger has an elongated side-opening channel portion characterized by upper and

lower spaced flanges with spaced inturned longitudinal lips at the mouth of the channel,

the improvement wherein a flexible tape secured to the face of the upper margin of the drape has formed integrally therewith a plurality of longitudinally spaced laterally projecting longitudinal flanges from the outer longitudinal margin of each of which project integral divergent flanges



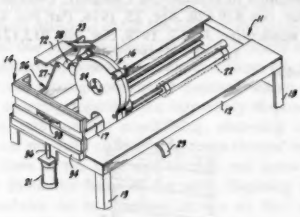
whose total width is greater than the spacing between the lips of the hanger flange, said divergent tape flanges being slidable in said channel and providing for suspension of the drape from the hanger, said divergent flanges being sufficiently resilient to accommodate flexing thereof for snap action application thereof to and removal thereof from the hanger channel.

4,216,565

MEAT STRIPPING MACHINE FOR FOWL

Anthony J. Volk, 1232 South Ave., Turlock, Calif. 95380, and Robert Groh, Turlock, Calif., assignors to Anthony J. Volk, Turlock, Calif.

Filed Feb. 26, 1979, Ser. No. 15,473
Int. Cl.[2] A22C *17/04, 21/00*
U.S. Cl. 17—1 G **6 Claims**



1. A meat stripping machine for fowl comprising

gripping means having moveable jaws for gripping a fowl leg bone and tendons immediately behind hocks,

a stripping unit having a plurality of radially moveable stripping knives and being mounted for movement longitudinally of the machine,

a cam unit defining a cam surface extending longitudinally of said machine,

cam follower means engaging said cam surface and operating said stripping knives for radially moving said knives in accordance with said cam surface as said stripping unit moves longitudinally of said machine, and

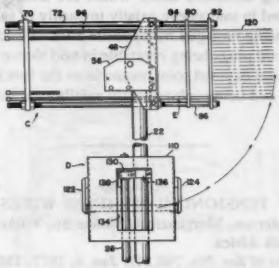
drive means for moving the jaws of said gripping means and moving said stripping unit longitudinally of the machine and a bone mounted therein.

4,216,566

TENDERIZER

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Filed Jun. 19, 1978, Ser. No. 917,317
Int. Cl.[2] A22C *9/00*
U.S. Cl. 17—25 **3 Claims**



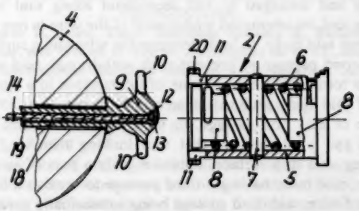
1. An apparatus for tenderizing a comestible product, such as, meat comprising; an intermittently advanced horizontal conveyor for supporting and conveying thereon a product to be tenderized; vertically movable carriage support members at opposite sides of said conveyor; a first carriage above said conveyor and having a multiplicity of closely spaced aligned apertures with rod-like member having a long thin product piercing instrumentality connected to its one end slidable in each of a plurality of the aligned apertures and operatively connected to the carriage by overload release means; means for selectively connecting said first carriage to said carriage support members in one of different angular positions about a horizontal axis above said conveyor and extending transversely thereof; power means for reciprocating said carriage support members to cause said instrumentalities to pierce a product on said conveyor; a second carriage arranged to move in coordination with movements of said first carriage; a member overlying said conveyor and detachably connected to said second carriage to engage a product being pierced by said instrumentalities,; and means for locking said second carriage in position with said member connected thereto engaged with the product while said instrumentalities are being withdrawn from a product.

4,216,567

FLEXIBLE ORNAMENTAL ARTICLE AND FASTENER THEREFOR

Jorg Heinz, Ringstrasse 4, 7530 Pforzheim, Fed. Rep. of Germany

Filed Jun. 14, 1976, Ser. No. 695,831
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1975, 7519062; Jan. 24, 1976, 7601893
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—81 J **21 Claims**



1. A fastener for connecting two parts of an elongated flexible ornamental article, comprising

a sleeve, which is open at both ends and provided with first bayonet joint means adjacent to each end thereof,

two plugs, each of which is provided with second bayonet joint means, which are contained in said sleeve and interengage with said first bayonet joint means,

a helical compression spring contained in said sleeve between said plugs for urging said plugs axially apart, and

two spring abutment discs, which are axially slidable and mounted in said sleeve axially inwardly of said plugs, said discs being engaged by opposite ends of said spring,

each of said plugs being rotatable in said sleeve to disengage its second bayonet joint means from the first bayonet joint means and being subsequently axially movable out of said sleeve.

4,216,568

TENSIONING OF METAL WIRES

Nigel I. Anderson, Morgenzicht, Sloane St., Witkoppen, Transvaal, South Africa

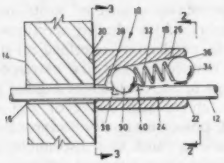
Continuation of Ser. No. 760,141, Jan. 6, 1977. This application Dec. 13, 1978, Ser. No. 969,010

Claims priority, application South Africa, Jan. 22, 1976, 76/0364

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.[2] F16G *11/00*

U.S. Cl. 24—136 A **1 Claim**



1. A device for holding under tension a length of wire having not more than two strands, said device comprising a body having parallel planar ends and having a first passage extending therethrough substantially normal to said ends, said first passage receiving the wire, said body further having a single second passage extending therethrough and having one end opening to a zone of intersection with said first passage, said second passage having an angle of intersection less than 15° with said first passage, a single locking member located in said second passage, a spring urging said locking member towards said zone of intersection, means at the other end of the second passage for retaining said spring in said body, said locking member and said second passage having a larger cross-sectional size relatively to a cross-sectional size of said first passage whereby said locking member cannot enter any part of said first passage except a part included in said zone of intersection, said locking member having a body of revolution about an axis and arranged to roll thereabout along said second passage and, on attempted withdrawal of the wire in one direction from said body, to lock between the wire and a surface of said second passage to prevent such withdrawal; said second passage terminating at said zone of intersection in a stop surface of said body inclined at an angle greater than 15° to a surface of said first passage on which the wire bears when locked and positioned so that said locking member, when engaging said stop surface, obturates only a part of said first passage, said body having a third passage to receive a further length of wire, said third passage being substantially parallel to said first passage and having a cross-section to accommodate with clearance another length of wire of the same cross-section as the length of wire to be received in said first passage.

4,216,569

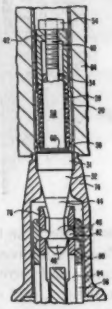
METHOD FOR INSTALLING A TUBE IN A HEAT EXCHANGER TUBE SHEET

Richard L. Stiller, St. Louis County, Mo.; Robert Shaffer, Swissvale, Pa.; Edward H. Smith, Plum Borough, Pa., and Regis R. Vollmer, Trafford, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1978, Ser. No. 965,016

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—157.3 C **21 Claims**



1. A method for installing a tube in a heat exchanger tubesheet, said method comprising:

assembling a first guide-expander in an open end of a tube;

inserting the tube and said first guide-expander assembled therein through a tubesheet aperture from a secondary to a primary side;

radially expanding said guide-expander so as to radially enlarge the tube into contact with the tubesheet aperture's wall; and

extracting said guide-expander from the enlarged tube.

4,216,570

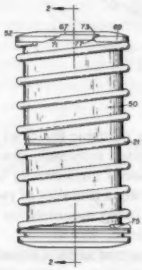
METHOD OF ASSEMBLING A SHOCK ABSORBER EMPLOYING A COIL SPRING

Richard C. Farris, Jeshua, and William S. Butler, Burleson, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 679,620, Apr. 23, 1976, Pat. No. 4,106,412. This application Jun. 2, 1978, Ser. No. 912,121

Int. Cl.[3] B23P *19/00*

U.S. Cl. 29—434 **1 Claim**



1. A method of assembling a shock absorber employing a coil spring, comprising:

(a) assembling a cylinder portion of said shock absorber, said cylinder portion having a radial abutment at one end thereof;

(b) assembling a piston portion of said shock absorber, said

piston portion having a radial abutment at one end thereof;

(c) coaxially aligning said portions with said radial abutments at the non-adjacent ends thereof;

(d) moving said portions axially together;

(e) snap-fitting said portions together in response to said axial movement;

(f) creating a circumferential opening in at least one of said radial abutments and

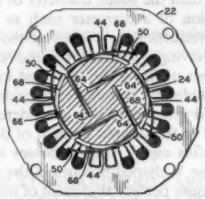
(g) screwing said coil spring through said circumferential opening to a position between said radial abutments.

4,216,571

METHODS AND APPARATUS FOR INSERTING WINDING END TURN PHASE INSULATION

Sammy L. Miller, Jurong Town, Singapore, and Alan L. Kindig, Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Jun. 22, 1978, Ser. No. 918,055
Int. Cl.² H02K *15/10*
U.S. Cl. 29—596 **25 Claims**



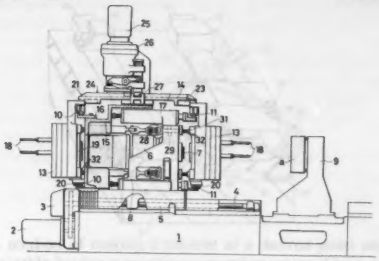
1. A method of fabricating a dynamoelectric machine stator assembly including a core having faces, having a longitudinally extending bore, and having a plurality of longitudinally extending slots opening into the bore; including a plurality of windings having side turns disposed within the slots, and having end turns disposed about the faces of the core; and including at least one phase insulator having oppositely disposed end turn insulators disposed between end turns of at least two windings and having connectors disposed within some of the slots for securing together the oppositely disposed end turn insulators; said method comprising: disposing at least one winding on the core so that side turns thereof reside within selected slots of the core and so that end turns thereof are disposed about the faces of the core; disposing at least one phase insulator on an inserting device so that at least two connectors thereof are accommodated thereon and so that at least part of the end turn insulators are disposed about the inserting device; retaining the end turn insulators on the inserting device; aligning and moving the core and inserting device relative to each other so that the inserting device is within the bore of the core; releasing the end turn insulators and moving at least one connector into a slot of the core; moving at least one remaining connector of the at least one phase insulator from the inserting device into another slot; moving the core and inserting device relative to each other so as to remove the inserting device from the bore of the core; and disposing at least one other winding on the core so that side turns thereof reside within slots of the core and so that end turns thereof are disposed about the faces of the core and so that at least part of the end turns thereof are separated from at least part of the end turns of the at least one winding by the end turn insulators of the at least one insulator.

4,216,572

REPLACEABLE GANG HEAD MACHINE TOOL

Takeshi Matsushita; Jinsei Ida, both of Sayama, and Kazuo Otsuka, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1978, Ser. No. 967,307
Int. Cl.² B23Q *3/157*
U.S. Cl. 29—568 **9 Claims**



1. A replaceable gang head machine tool unit comprising a base, a slide table mounted on said base for movement between retracted and advanced positions, an annular rail on said machine base including a rear stationary portion and a front movable portion, a plurality of gang heads mounted on said rail for travel thereon, said gang heads being disposed in angular spaced relation on said rail, a rotatable index table mounted on said base above said rail in coaxial relation therewith, means detachably connecting said index table to said gang heads to advance the gang heads on said rail in accordance with the rotation of said index table, said gang heads successively passing through an operating position, a working unit carried on said slide table and movable therewith between a rearward inoperative position and a forward operative position, said gang heads in said operating position being proximate said working unit in said rearward operative position thereof, means on said working unit and on said gang heads for (a) detachably coupling said working unit with the particular gang head at said operating position as said working unit advances from said rearward inoperative position to said forward operative position and (b) for releasing the coupled gang head from said working unit as said working unit travels from said forward operative position to said rearward inoperative position, said means which detachably connects the index table with the gang heads comprising a pin and slot connection in which a pin is slidably movable in a slot and separable therefrom, said index table having grooves therein forming a Geneva gear, and means for driving said index table in rotation including a drive motor and a Geneva pin driven by said motor and engaged in the grooves in the index table to effect stepwise rotation of said index table.

4,216,573

THREE MASK PROCESS FOR MAKING FIELD EFFECT TRANSISTORS

Madhukar L. Joshi, Essex Junction; Richard K. Mason, Colchester, and Wilbur D. Pricer, Burlington, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1978, Ser. No. 904,182
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **11 Claims**

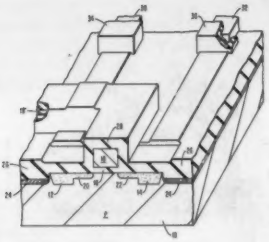
4. A method of making a field effect transistor at a surface of a semiconductor substrate which includes the steps of:

forming a diffusion region having first and second spaced apart portions in said substrate,

then forming a first insulating layer of a given thickness outside of said diffusion region in contact with the first portion of said diffusion region,

defining a contact region at the second portion of said diffusion region and a transistor region on said insulating layer,

oxidizing said diffusion region from said contact region to said insulating layer at the first portion of said diffusion region to form a second insulating layer having a thickness substantially greater than said given thickness, and



forming within said transistor region a gate electrode on said first insulating layer and a current carrying electrode in said substrate from said gate electrode to the first portion of said diffusion region and a contact electrode in contact with said diffusion region at said contact region,

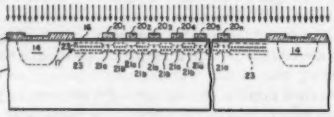
forming a conductor extending over said thicker layer along a line spaced from said contact electrode.

4,216,574

CHARGE COUPLED DEVICE

Wolfgang M. Feist, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 29, 1978, Ser. No. 920,594
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—578 **5 Claims**



1. A method comprising the steps of:

(a) forming an insulating layer with uniform thickness over a surface of a semiconductor body, such semiconductor body having a first type conductivity;

(b) ion implanting particles generating a second type conductivity into the semiconductor body through the insulating layer forming a doped layer of predetermined doping concentration in the semiconductor body, such second type conductivity being opposite to the first type conductivity of the semiconductor body;

(c) forming a first plurality of gate electrodes in spaced relationship on the insulating layer and over the doped layer;

(d) ion implanting particles generating the second type conductivity through portions of the insulating layer disposed between spaced regions of the first plurality of gate electrodes into corresponding spaced regions of the doped layer disposed beneath the spaced regions of the first plurality of gate electrodes; and

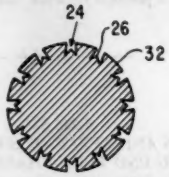
(e) forming a second plurality of gate electrodes on the portions of the insulating layer disposed between the spaced regions of the first plurality of gate electrodes and over the spaced regions of the doped layer having increased doping concentrations.

4,216,575

METHOD OF REFORMING THE FINS OF A FINNED TUBE

Theodore C. Carnavos, Bethel, and Walter J. Golymbieski, Woodbury, both of Conn., assignors to Noranda Mines Limited, Toronto, Canada

Filed Feb. 1, 1979, Ser. No. 9,399
Int. Cl.[2] H01R *43/08*
U.S. Cl. 29—597 **6 Claims**



1. A method of making a finned tube comprising:

(a) forming a tube having a plurality of internal longitudinal fins with a V-notch at the tip of the fins; and

(b) reforming the tips of the fins of said tube over a shaped plug having a guide portion which has an outside diameter slightly smaller than the inside diameter of the tube and a deforming portion of a diameter such as to perform a predetermined reduction in cross-sectional area of the tube, said plug having a plurality of grooves corresponding to the number of fins to be reformed in the tube and extending longitudinally through said guide and deforming portions, said grooves having an undercut of a width which is related to the desired amount of deformation of the tips of the fins and V-shaped bosses at the bottom which engage the V-shaped notches in the guide portion of the plug to ensure perfect alignment of the fins with the deforming grooves and symmetrical splitting of the tips of the V-shaped notches so that the tips of the fins are wider than the fin thickness.

4,216,576

PRINTED CIRCUIT BOARD, ELECTRICAL CONNECTOR AND METHOD OF ASSEMBLY

J. Preston Ammon, and Harry R. Weaver, both of Dallas, Tex., assignors to Elfab Corporation, Dallas, Tex.

Division of Ser. No. 805,727, Jun. 13, 1978, abandoned. This application Aug. 7, 1978, Ser. No. 931,318
Int. Cl.[2] H05K *3/32, 3/28*
U.S. Cl. 29—845 **9 Claims**

1. An improved method of manufacturing a printed circuit board assembly of the type having an insulative mounting substrate including patterns of conductive material upon at least one surface thereof and holes in the board extending through portions of the conductive patterns, the holes being plated with a conductive material which is in electrical contact with the conductive pattern adjacent the holes;

wherein the improvement comprises the steps of immersing said board in a fluid medium of dielectric material adapted for adhering to exposed surfaces immersed therein;

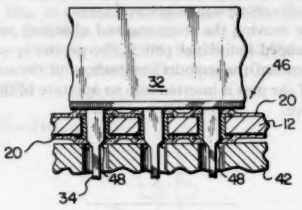
withdrawing said board from said fluid medium and allowing excess dielectric material to drain therefrom so that the remainder of the material forms a thin film upon said board;

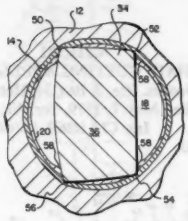
drawing a gaseous fluid through the holes in said board to form a thin film of dielectric material uniformly along the side walls thereof;

curing said dielectric material into a solid insulative coating upon said board and along the side walls of the holes formed therein; and

press fitting a conductive contact having an angular edge portion directly through said insulatively coated holes

with said edge penetrating said insulative coating and engaging the conductive material thereunder to deform





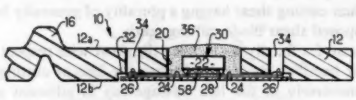
the conductive material around said edge portion and effect a tight and rigid electrical and mechanical interengagement.

4,216,577

PORTABLE STANDARDIZED CARD ADAPTED TO PROVIDE ACCESS TO A SYSTEM FOR PROCESSING ELECTRICAL SIGNALS AND A METHOD OF MANUFACTURING SUCH A CARD

Bernard Badet, Rosny; François Guillaume, St. Leu la Foret, and Karel Kurzweil, Eaubonne, all of France, assignors to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Division of Ser. No. 751,954, Dec. 17, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,686
Claims priority, application France, Dec. 31, 1975, 75 40361
Int. Cl.[2] H05K *3/32*
U.S. Cl. 29—831 **11 Claims**



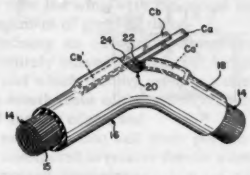
1. A method of producing cards adapted to provide access to a system for processing electrical signals, comprising: providing a plurality of sheets, each having at least one cavity and being of a predetermined surface area and thickness and having associated contact positions adjacent said cavity, providing a plurality of integrated circuit assemblies each including a substrate having a surface area and a thickness substantially smaller than said predetermined surface area and thickness of said sheets and carrying at least one circuit device and an associated array of conductors, inserting each of said integrated circuit assemblies into a corresponding one of said cavities, and attaching the conductors of each of said assemblies to associated contact positions on the corresponding one of said sheets to thereby form said card for processing electrical signals.

4,216,578

METHOD FOR MAKING AN ELECTRIC CABLE WITH IMPROVED TAKEOUTS

Jean F. Trigon, Montluel, France, assignor to Societe l'Electricfil, Lyons, France

Filed Jul. 19, 1978, Ser. No. 925,911
Claims priority, application France, Jul. 29, 1977, 77 23395
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—857 **3 Claims**



1. A method of making a takeout at a desired point on an electric cable having a conductor member covered by a continuous insulating sleeve, comprising;

(a) making at said desired point an opening in said insulating sleeve which exposes only a portion of the bare conductor member, with said sleeve remaining otherwise continuous and uninterrupted;

(b) inserting through said opening, between said conductor member and said insulating sleeve, the inner end of a first conductor element so that said inserted inner end (1) is covered by said sleeve, (2) frictionally and electrically engages in touching and non-wrapping relation the electric conductor member, and (3) extends along one longitudinal direction of said conductor member:

(c) inserting through said opening, between said conductor member and said insulating sleeve, the inner end of a second conductor element so that the inserted inner end of said second conductor member (1) is covered by said sleeve, (2) frictionally and electrically engages in touching and non-wrapping relation said electric conductor member, and (3) extends along an opposite longitudinal direction of said conductor member, said opening having an area which is related to the combined cross-sectional areas of said first and second conductor elements; and

(d) joining together the outer ends of said first and second conductor elements external of said sleeve to form said takeout.

4,216,579

STORAGE BATTERY PLATE WRAPPING MACHINE

Kazuo Murata, and Kotofusa Kuroda, both of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Filed Jul. 25, 1978, Ser. No. 927,845
Claims priority, application Japan, Jul. 28, 1977, 52-91220
Int. Cl.[2] B23P *19/04*; H01M *2/18*
U.S. Cl. 29—730 **8 Claims**

1. A storage battery plate wrapping machine, comprising:

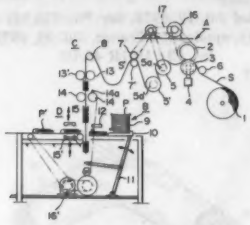
means for embossing a flat microporous sheet fed from a supply reel to obtain embossed separator material in a continuous length;

a separator feeding means for feeding said embossed separator material;

transport means for transporting the embossed separator from said embossing means to said separator feeding means and including means for detecting the length of separator between said embossing means and said separator feeding means, and means responsive to said means for detecting for controlling the length of separator between said means for embossing and said separator feeding means;

means for cutting said separator;

a plate separating and delivering means for separating and delivering plates from a hopper to fold the cut separator material about a delivered plate; and



means for joining the parts of the separator about an individual plate therein.

4,216,580

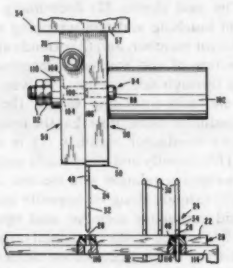
METHODS OF AND APPARATUS FOR ASSEMBLING ARTICLES WITH A SUPPORT

William M. Chisholm, Midlothian, Va., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,159

Int. Cl.³ H05K *3/00, 3/22;* B23P *19/00*

U.S. Cl. 29—842 **26 Claims**



1. A method of simultaneously inserting one end of each of a plurality of individual pins into apertures of a support structure in a precise spaced alignment where the pins are initially integrally held in the spaced alignment by a carrier strip extending between adjacent end portions of the pins, which comprises the steps of:

moving an intermediate portion of each of the integrally held pins into one of a plurality of nests of a pin applicator with the nests being spaced in the precise alignment;

separating the carrier strip from the pins as the pins are being moved into the nests;

clamping the intermediate portions of the pins within the nests so that the pins are held individually with the pin applicator in the precise alignment; and

moving the pin applicator toward the support structure with the clamped pins until the one end of each of the pins is inserted into an aperture of the support structure.

13. An apparatus for simultaneously inserting one end of each of a plurality of individual pins into apertures of a support structure in a precise spaced alignment where the pins are initially integrally held in the spaced alignment by a carrier strip extending between adjacent end portions of the pins, which comprises:

means for receiving an intermediate portion of each of the integrally held pins in the precise spaced alignment;

means for separating the carrier strip from the pins as the pins are being moved into the receiving means so that the pins are held individually with the receiving means in the precise spaced alignment;

means for clamping the intermediate portions of the pins within the receiving means; and

means for moving the receiving and clamping means with the clamped individual pins in the precise spaced alignment toward the support structure until the one end of each of the pins is inserted into an aperture of the support structure.

4,216,581

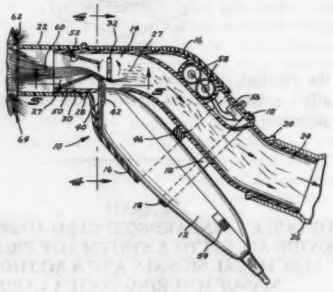
HAIR CUTTING APPLIANCE

Kevin D. Van Slooten, Rte. 2, Box 34, Hettinger, N. Dak. 58639

Filed May 7, 1979, Ser. No. 36,340

Int. Cl.³ B26B *19/44*

U.S. Cl. 30—133 **4 Claims**



1. A hair cutting appliance for use with a means for drawing a vacuum, said appliance being useful to cut a customer's hair to uniform minimum length, and said appliance including:

A. a hair handling device having a forward intake portion and a rearward exhaust portion, said device being provided with a substantially imperforate hair passageway extending through the device from the intake to the exhuast portion;

B. a hair cutting shear having a plurality of generally linearly disposed shear blade cutting teeth;

C. means for fixedly positioning the shear with respect to the hair handling device to dispose the line of cutting teeth transversely of the hair passageway in adjacent spaced relation to a forward end of the intake portion of the hair handling device, and inside of the hair passageway;

D. said hair handling device including:

(1) a first inclined hair ramp disposed between a forward edge of the intake portion of the hair handling device and said shear blade cutting teeth, an interior end of said ramp terminating adjacent to, forwardly of and short of said cutting teeth, and

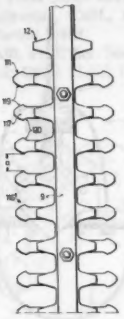
(2) a second inclined hair ramp disposed between a forward edge of said intake portion and said shear blade cutting teeth, said ramp being disposed in generally opposite, spaced apart, opposed relation to said first ramp, an interior end of said second ramp terminating in spaced relation to and outwardly from said cutting teeth; and

E. means for attaching said means for drawing a vacuum onto said exhaust portion of said hair handling device.

4,216,582
HEDGE TRIMMER

Kurt Paule, Stuttgart, and Eberhard Vogel, Dettenhausen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1978, Ser. No. 962,756
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752234
Int. Cl.[2] B26B *19/02*
U.S. Cl. 30—216 14 Claims

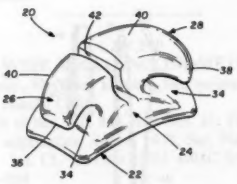


1. In a hedge trimmer having a housing (1,2);
adapted to be hand-held by an operator,
a first blade (111) having first teeth (117)
a second blade (12) having a plurality of substantially trapezoidally shaped teeth (18)
and driving means in the housing for reciprocating said first blade relative to the housing and to said second blade, wherein
the first teeth (117) on the first blade each have a first predetermined length at least twice as long as the length of the teeth (12) on said second blade.

4,216,583
ORTHODONTIC APPLIANCE

James M. Reynolds, Lubbock, Tex., assignor to Zulauf Inc., Lubbock, Tex.

Filed Aug. 3, 1978, Ser. No. 930,577
Int. Cl.[2] A61C *13/22*
U.S. Cl. 433—9 11 Claims

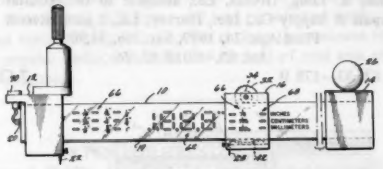


1. An orthodontic appliance comprising:
a base having an inwardly facing surface on one side thereof adapted for attaching the appliance and a body portion extending outwardly from the other side of said base;
said body portion having a length substantially shorter than the length of the base and a width at least slightly narrower than the width of the base;
a pair of wings extending in opposite directions from the body portion of said base, each wing having a length substantially shorter than the length of the body portion and a width substantially narrower than the width of the body portion to define wire receiving slots between the base and the ends of said wings;
the wings tapering from a relatively narrow incisal surface at one end of one of the wings to a relatively wider gingival surface at the opposite end of the other wing, said wings form a gentle wedge-like shape in both length and width directions so that food tends to move past the appliance during patient chewing;
the wing having the gingival surface defining a relatively larger slot than the wing with the incisal surface to prevent impingement of gingival tissue;
the wings defining an outwardly facing domed surface which is entirely curved in both the length and width directions and which thereby presents a comfortable surface to the mouth tissue of the patient characterized by an absence of angular edges; and
a cross slot extending into said body portion between the wings and configured to receive therein a dental appliance of predetermined dimensions.

4,216,584
DIGITIZED DISTANCE MEASURING DEVICE

J. Michael Meissner, 42 S. Quincy, Hinsdale, Ill. 60521, and Norman F. Fyler, 970 North Ave., Deerfield, Ill. 60015

Filed Sep. 19, 1978, Ser. No. 944,199
Int. Cl.[3] G01B *7/02*
U.S. Cl. 33—143 L 28 Claims

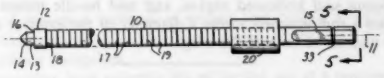


1. A distance measuring device comprising:
a glass beam;
fixed reference means rigidly attached to said beam for providing a first reference point;
variable reference means slidably attached to said beam for providing a second reference point;
means for producing a signal related to the distance between said first and second reference points; and
means for multiplying said signal so that said multiplied signal represents the distance between said first and second reference points multiplied by a scaling factor.

4,216,585
DEPTH GAGE

Edwin E. Hatter, Torrance, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Sep. 26, 1978, Ser. No. 945,907
Int. Cl.[2] G01B *5/18*
U.S. Cl. 33—169 B 4 Claims



1. A grip gage for measuring the depth of a hole through a member which is to be held by a threaded fastener to a threaded nut-plate having an internal thread with an inside and a base thread diameter, said hole having a hole diameter at least as large as said base thread diameter, comprising:
(a) a rod having a linear axis, adapted to be passed through the hole; said rod having
(i) a first cylindrical section of a diameter no larger than

the diameter of the hole and larger than said inside thread diameter;

(ii) a second cylindrical section rearward of the first cylindrical section, of lesser diameter than that of the first cylindrical section and adapted to make an axially sliding fit within the threads of the nut-plate;

(iii) a flat annular shoulder on the first cylindrical section at the junction of the first and second cylindrical sections, in a plane normal to said axis, said shoulder being adapted to abut the annular region of the face of the nut-plate which is to abut the rear face of the member; and

(iv) graduated markings on the exterior surface of the rod, forward of said shoulder, to indicate distance from the shoulder, said rod at said first and second sections being solid and unslotted, whereby their diameters are invariable; and

(b) a sleeve slidable axially on said rod forward of the shoulder, and having a flat face adapted to abut the front face of said member;

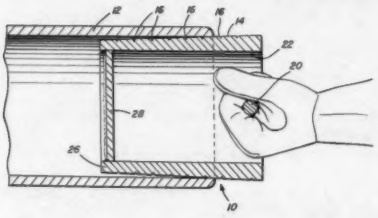
whereby when the rod is inserted into the hole until the shoulder abuts the nut while said nut-plate abuts the rear face of the member, and the sleeve is slid to abut the front face of the member, the marking on the stem corresponding to the position of sleeve indicates the depth of the hole.

4,216,586

PIPE INSIDE DIAMETER MEASUREMENT GAUGE

Thomas R. Long, Gretna, La., assignor to Intracoastal Pipe Repair & Supply Co., Inc., Harvey, La., a part interest

Filed Apr. 24, 1979, Ser. No. 34,908
Int. Cl.[2] G01B *03/46*
U.S. Cl. 33—178 B **7 Claims**



5. A pipe inside diameter measurement gauge for measuring the inside diameter of a length of pipe having an open end, comprising, in combination, insertable means comprising a frusto-conical tapered plug for insertion into the open end of pipe and handle means connected to the insertable means for guidingly inserting the insertion means into the open end of pipe, the insertable means including measuring means comprising a uniformly tapered exterior surface of said tapered plug for determining the inside diameter of the open end, the measuring means having indicating means for determining whether the pipe inside diameter exceeds a predetermined limit, said tapered plug is hollow and open on the maximum circumferential exterior end, said tapered plug having an interior surface defining said hollowed region, and said handle means comprises a rod attached across a diameter of the exterior end at the interior surface of the plug.

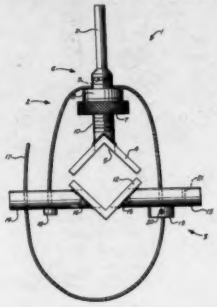
4,216,587

ALIGNMENT INDICATOR CLAMP APPARATUS

Willice D. Stone, 1402 Ferdinand St., Plaquemine, La. 70764

Filed Jan. 29, 1979, Ser. No. 7,225
Int. Cl.[2] G01B *3/30*
U.S. Cl. 33—180 R **5 Claims**

1. An alignment indicator clamp apparatus for removably and fixedly attaching an alignment indicator to one of two shafts to be aligned, said apparatus comprising upper and lower shaft engaging members each having a shaft engaging surface, said upper shaft engaging member additionally having opposite the shaft engaging surface thereof a cable tightening mechanism including as a portion thereof at least one post for attaching said alignment indicator, said lower shaft engaging member additionally having cable passage means, said upper and lower shaft engaging members being releasably joined for tightening about said one shaft by a cable having fixed stop means at one end thereof and a slidably adjustable stop means so that passage of said cable through a cable passage means of said lower shaft



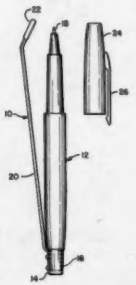
engaging member located substantially opposite said upper shaft engaging member on said one shaft until stopped by said fixed stop means, then upwardly about the circumference of the shaft through said cable tightening mechanism of said upper shaft engaging member and continuing back through another cable passage means of said lower shaft engaging member with attachment and hand tight securing of said slidably adjustable stop means joins said upper and lower shaft engaging members for subsequent tightening of the cable to removably and fixedly attach said alignment indicator clamp apparatus to said one shaft.

4,216,588

MARKING PEN HOLDER

William Richards, Medway, and Bernard Grolman, Worcester, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Dec. 6, 1978, Ser. No. 951,555
Int. Cl.[2] B43L *13/00*; B25D *5/00*
U.S. Cl. 33—189 **3 Claims**



1. A marker comprising the combination of:

a pen having a marking tip at one of its ends; and

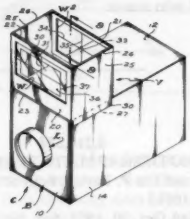
a long and relatively slender spring arm having one end attached to an end of said pen oppositely of said marking tip, said arm extending along a side of said pen to a termination adjacent said marking tip, said termination being in

the form of a bifurcation having a pair of legs straddling said marking tip, said bifurcation normally being resiliently biased away from said marking tip whereby said spring arm provides a rest for steadying said pen prior to and during performance of a marking operation, the latter being effected by pressing said marking tip towards said bifurcation.

4,216,589
SIGHTING DEVICE FOR SURVEILLANCE CAMERA

Richard C. Beaver, Inglewood, Calif., assignor to American Electronics, Inc., Fullerton, Calif.

Filed Nov. 20, 1978, Ser. No. 962,307
Int. Cl.³ G01B *13/02;* **G03B** *13/02, 11/00;* **H04N** *5/30*
U.S. Cl. 33—266 **7 Claims**



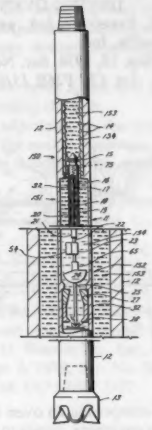
1. A temporary sighting device for cameras, comprising:
a rectangular frame having substantially parallel, axially spaced front and rear walls with substantially parallel, opposite side edges, and central axially aligned windows with outer perimeters;
opposed side walls with substantially parallel opposite side edges;
means joining the side edges of the side walls with related side edges of the end walls;
means to mount and orient said frame on a camera case;
the aforesaid means joining the edges of the side and end walls being hinged, whereby said frame is foldable between an operative position in which the planes of the end walls are normal to the planes of the side walls, and a folded position in which the planes of the end walls are substantially parallel with the planes of the side walls and said side and end walls are in juxtaposition; and
a set of related sighting markings within the perimeters of the windows in alignment on the central longitudinal axis of the frame.

4,216,590
WIDE ANGLE INCLINOMETER

Robert R. Kelly, Hoffman Estates, Ill., assignor to BJ-Hughes Inc., Long Beach, Calif.

Continuation of Ser. No. 844,398, Oct. 21, 1977, abandoned.
This application Apr. 6, 1979, Ser. No. 27,771
Int. Cl.³ E21B *47/022;* **G01C** *9/00*
U.S. Cl. 33—304 **14 Claims**

1. In apparatus for measuring the angular deviation from a preselected drift angle of the end of a drill string, the combination comprising:
a housing adapted for insertion in said drill string;
a pendulum pivotally mounted in said housing and having an axis, said axis being normally aligned with the vertical under the influence of gravity;
a cylindrical catch link pivotally mounted at the same point as said pendulum, said catch link being substantially balanced about said pivot point;
means for aligning the longitudinal axis of said catch link substantially parallel with the axis of said drill string;
means for coupling together said pendulum and catch link such that the angle between said axes of said catch link and pendulum substantially equal said preselected angle;
means for measuring the angular deflection from the vertical of said axis of said pendulum coupled to said catch link, to

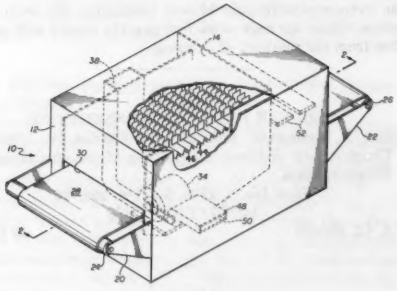


thereby measure the difference between said angular deviation of said drill string and said preselected angle;
and means for signaling to the surface the measure of said angular deflection from the vertical of said axis of said pendulum.

4,216,591
DRYER FOR PRINTED MATERIAL

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Co., Chicago, Ill.

Filed Nov. 29, 1978, Ser. No. 964,491
Int. Cl.³ F26B *7/00*
U.S. Cl. 34—18 **12 Claims**



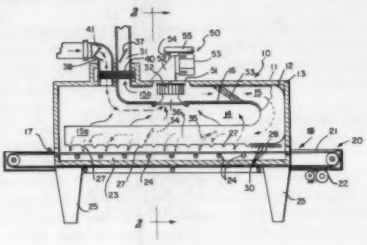
1. A two-step method of drying and curing a water- or solvent-based printing ink screen printed on dry stock or material which comprises,
impinging high velocity jets of heated air, at a temperature from ambient to about 350° F., against the ink imprint on said imprinted stock or material until the water or solvent is substantially removed from said imprint and said ink imprint is heated to an elevated temperature,
moving said stock or material to another position and, while said ink imprint is still warm,
heating said ink imprint on said stock or material by radiant heat to a predetermined higher temperature for a time

sufficient to cure said ink imprint without scorching said stock or material.

4,216,592
DRYING OVEN

Robert L. Koch, II, Evansville, Ind., assignor to George Koch Sons, Inc., Evansville, Ind.

Filed Sep. 15, 1978, Ser. No. 942,598
Int. Cl.[2] F26B *13/02*
U.S. Cl. 34—68 **10 Claims**

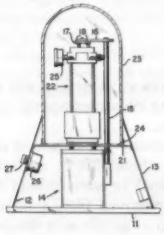


6. A curing oven comprising an oven enclosure, a source of heat within the oven enclosure, means to circulate and exhaust the oven atmosphere and to provide a flow of make-up air into the oven enclosure, a duct work within the oven enclosure to direct a circulation of the oven atmosphere, said means to circulate and exhaust the oven atmosphere and to provide a flow of make-up air into the oven enclosure comprising a single blower carried within the duct work, a conveyor means defining a path for carrying articles through the oven enclosure between an entrance and an exit of the oven enclosure, said duct work including a wall adjacent the path of said articles within the oven enclosure from adjacent the entrance of the oven enclosure to the exit opening of the oven enclosure, the portion of said wall adjacent the exit end of the oven enclosure being heated by infrared radiation means and the remainder of said wall defining a plurality of openings to direct the circulation of oven atmosphere from within the duct work at the coated articles as they travel their defined path through the oven enclosure, said blower circulating the oven atmosphere within the duct work first past the heated wall portion then from the plurality of openings.

4,216,593
NUCLEAR POWER DEMONSTRATING

Vahan V. Basmajian, Billerica, and Charles W. Haldeman, Concord, both of Mass., assignors to Megatech Corporation, Billerica, Mass.

Filed Jan. 5, 1978, Ser. No. 866,996
Int. Cl.[2] G09B *23/20*
U.S. Cl. 35—10 **10 Claims**

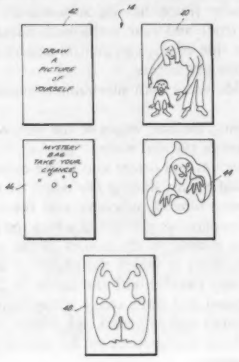


1. Nuclear power simulating apparatus comprising,
means including a transparent cylinder defining a boiler having input plumbing for receiving water to be heated and converted into steam and outlet plumbing for delivering the steam;
electrical immersion heating elements inside said boiler for heating water therein and converting it into steam,
means including a mechanically controllable electrical energy source for controlling the energy delivered to said heating elements and thereby the rate at which water therein is converted into steam,
simulated pile rods inside said boiler, and
means for mechanically coupling said mechanically controllable source to said simulated pile rods so that increasing the energy delivered to said heating elements is accompanied by withdrawal of said pile rods from said boiler by a distance proportional to the energy delivered to said heating elements and increase in the rate at which water is converted into steam.

4,216,594
PSYCHOTHERAPEUTIC TESTING GAME

Cheryl Farley, and Ira P. Farley, both of 99 Harold St., Staten Island, N.Y. 10312

Filed Oct. 30, 1978, Ser. No. 955,969
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—22 R **15 Claims**



1. A psychotherapeutic testing game comprising:
a. game means for providing a game playing atmosphere between a tester and a player; said game means including a playing surface having a playing path divided into a plurality of progressive segments, and a plurality of movable playing elements to be moved by a player in the segments along the path;
b. a plurality of cards for a plurality of psychological testing categories and containing information to elicit a personal phychological response of a player corresponding to the selected category whereby the player upon giving said response is given an award commensurate with the selected category; and
c. chance selection means being integral to the game and comprising first selection means for determining a category of said plurality of psychological testing categories and second selection means being random number selection means to indicate the segments to be moved in said path, whereby operation of said first and second means by the player is in game play so as to mask the effect of providing psychotherapeutic responses to said cards.

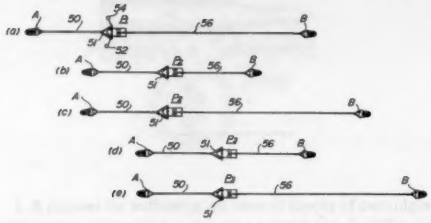
4,216,595
METHOD OF COLLECTING SHELLFISH

Hisao Kato, No. 37, 2-chome, Showa-machi, Nemuro City, Hokkaido, and Yohei Sakamoto, No. 1, 1-chome, Hon-cho, Nemuro City, Hokkaido, both of Japan

Continuation-in-part of Ser. No. 901,693, May 1, 1978, abandoned, which is a division of Ser. No. 723,470, Sep. 15, 1976, Pat. No. 4,112,602. This application Jun. 16, 1978, Ser. No. 916,060

Int. Cl.[2] A01K *75/00*; E02F *5/00*

U.S. Cl. 37—195 8 Claims



2. A method of collecting on a boat shellfish or the like from a body of water comprising the steps of settling on the bottom of said body of water from opposing sides of said boat and at a distance from said boat a collecting device, each of said collecting devices having a plurality of tines and a net bag to the rear of said tines, connecting each of said devices to said boat by a rope of predetermined length maintaining said boat in said water without powered movement and selectively pulling said ropes from said boat to cause one of said devices and said boat to move relatively toward each other and simultaneously causing the other of said devices to drag along the bottom of the water, both said devices remaining on the bottom of said water during movement and thereafter lifting at least one of said devices to said boat.

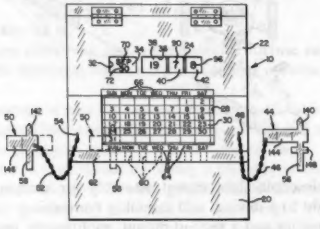
4,216,596
PERPETUAL CALENDAR

Elmer L. Brown, 844 Jackson Hwy. South, Toledo, Wash. 98591

Filed Nov. 13, 1978, Ser. No. 959,790

Int. Cl.[2] G09D *3/00, 3/10*

U.S. Cl. 40—118 2 Claims



1. In a perpetual calendar,

a sheet-like member having six horizontal rows divided into thirteen vertical rows, the numbers **1** to **7** being placed in the end seven spaces at the righthand portion of the top row, the numbers **2** to **14** being placed in the spaces of the second horizontal row, the numbers **9** to **21** being placed in the spaces of the third horizontal row, the numbers **16** to **28** being placed in the spaces of the fourth horizontal row, the numbers **23** to **31** being placed in the end nine spaces at the lefthand portion of the fifth horizontal row and the numbers **30** and **31** being placed in the end two spaces at the lefthand portion of the bottom horizontal row,

a cover over the sheet-like member having an opening exposing only seven vertical rows and all horizontal rows and having legends of the days of the week adjacent the opening and over the seven exposed vertical rows,

the member being adjustable horizontally relative to the cover to expose any desired consecutive seven vertical rows,

the sheet-like member being a belt and including a pair of pulley means mounting the belt,

hand pointer means adjustable on the cover to cover either the lowest row or the next to the lowest row and along the opening to indicate the day of the week of the first day of the next month,

the pointer means including a pair of pointers, one for covering the lowest row and the other for covering the two lowermost rows.

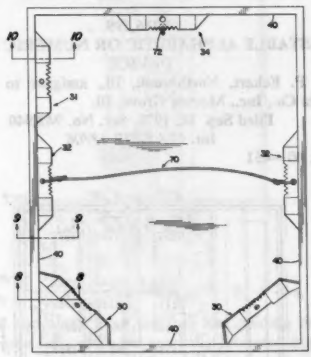
4,216,597
PICTURE FRAME RETAINING CLIP

Lawrence A. Kocina, and John N. Roche, both of Greenville, Pa., assignors to R. D. Werner Co., Inc., Greenville, Pa.

Filed Apr. 3, 1979, Ser. No. 26,656

Int. Cl.[3] G09F *1/12*

U.S. Cl. 40—156 14 Claims



1. A clip for retaining pictures in back-loading picture frames, comprising:

a resilient strip including a central web intermediate opposite ends, both said ends being deflected in the same direction from the plane of said central web, said central web having a first lateral edge and a second lateral edge; and

a flange along said first lateral edge extending from said central web in a direction generally opposite the deflection of said ends, wherein said strip may be positioned with said flange engaging the rear of the back-loading picture frame and the picture being retained between the front of the back-loading picture frame and said ends.

4,216,598
RELEASABLY SECURABLE DOOR KNOB TAG

Richard B. Newbert, Hickory Dr., Amherst, N.H. 03031

Filed Oct. 20, 1977, Ser. No. 843,823

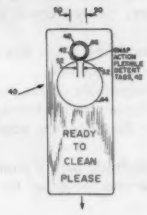
Int. Cl.[2] G09F *3/04*

U.S. Cl. 40—331 11 Claims

1. A windproof releasably securable door knob tag comprising:

a strip of resilient material forming the body of said tag, said strip having a tabless aperture, the edges of said aperture being spaced from the edges of the body of the tag, said aperture being large enough to accommodate the knob

portion of a door knob, a second tabless aperture, the edges of said aperture being spaced from the edges of the body of the tag, said second aperture being of a smaller size than said first aperture, yet of a size to accommodate the shaft of said door knob, and a channel between said two apertures; and,



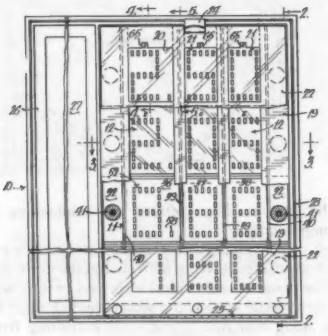
resilient tab means on either side of said channel projecting towards the center of said channel and having a separation less than the outside diameter of said door knob shaft, whereby when said tag is pulled over said door knob shaft in a predetermined direction, said resilient tab means cam outwardly on said door knob shaft and then snap back, thereby to releasably secure said tag to said door knob.

4,216,599

ADJUSTABLE ALPHABETIC OR NUMERIC DISPLAY DEVICE

Ronald P. Eckert, Northbrook, Ill., assignor to Thomas A. Schutz Co., Inc., Morton Grove, Ill.

Filed Sep. 18, 1978, Ser. No. 942,940
Int. Cl.[2] G09F *13/06*
U.S. Cl. 40—451 **37 Claims**



1. In a device for selectively displaying arabic numerals from 0 through 9, said device being of the type which includes a light box having an opaque front plate with transparent portions forming a number 8 that has parallel upright left and right side strips and parallel horizontal top, median and bottom connecting strips, each of said side strips comprising a column of transparent spots separated by opaque areas, and each of said horizontal strips comprising a horizontal line of transparent spots separated by opaque areas, the improvement comprising:

a flexible unstressed film member having a geometric pattern of vertical and horizontal opaque and transparent elements which may be used in cooperation with the transparent front plate spots to define any desired arabic numeral from 0 through 9 by moving the film member laterally across the front plate to align a selected part of said film member with said number 8, several of said opaque and transparent elements cooperating with the front plate spots to define parts of more than one numeral, whereby the length of the geometric pattern is considerably less than ten times the width of the number 8 on the front plate;

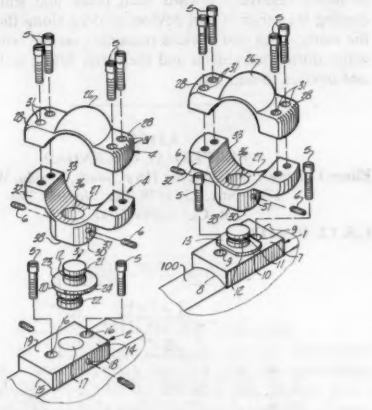
and guide means including spaced rearwardly extending side walls on said light box for positioning said film member with the part thereof for defining a selected arabic numeral against the front plate and with the parts of the film member at the two sides of said selected part bent rearwardly at the sides of the light box and lying in planar fashion along the outer faces of said sidewalls.

4,216,600

TELESCOPIC SIGHT MOUNT

Gerald G. Brueckner, 16135 Timberview, Fraser, Mich. 48026, and Edward Cantrell, 31251 Beechwood, Warren, Mich. 48093

Filed Oct. 10, 1978, Ser. No. 949,564
Int. Cl.[3] F41G *1/38*
U.S. Cl. 42—1 ST **9 Claims**



1. A telescopic sight mount assembly for securing a telescopic sight to a device, said assembly comprising:

a first mount and a second mount, each mount including a base;

means for attaching said bases to said device in a spaced relationship;

a first telescopic sight supporting means and first means for rotatably securing said first sight supporting means to said first base;

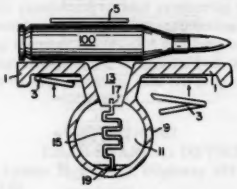
a second telescopic sight supporting means and second means for securing said second sight supporting means to said second base, said second securing means including an eccentric member the rotation of which laterally displaces said second supporting means with respect to the first supporting means.

4,216,601

MAGAZINE STATUS INDICATING PROCESS

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Continuation-in-part of Ser. No. 907,165, May 18, 1978, Pat. No. 4,142,313. This application Oct. 19, 1978, Ser. No. 952,698
The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.
Int. Cl.[3] F41C *27/14*
U.S. Cl. 42—1 B 10 Claims



1. A process for indicating the state of supply of cartridges in a magazine, comprising: generating a status signal with a sonic indicator positioned in said magazine.

4,216,602

LINE RETRIEVING AND DISPENSING DEVICE

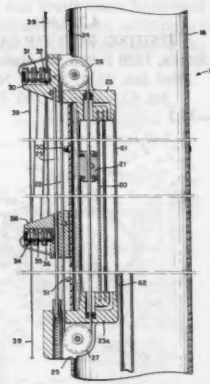
Dennis Daniels, Rte. 2, Box 782, Quilcene, Wash. 98376

Filed Oct. 10, 1978, Ser. No. 949,947
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—18 R 6 Claims

1. A line retrieving and casting device for use on an elongated pole having at least an outer and inner portion, comprising:

line storage means on said inner portion for accumulating wraps of line terminating at a terminal end and adapted to have an object attached to said terminal end;

said line storage means including a plurality of transversely spaced stationary first line guiding means mounted on said outer portion of said pole for receiving a plurality of wraps of said line, a plurality of movable transversely spaced second line guiding means freely movably mounted on said inner portion of said pole for movement from a first fully retracted position remote from said first line guiding means to a second fully extended position adjacent said first line guiding means and for receiving respective opposite wraps of said line from said first line guiding means with transversely spaced non overlapping partial loops of line each defined by a single wrap only around each set of corresponding transversely spaced first and second line guiding means, and actuating means for respectively letting out line by allowing reduction in the lengths of said wraps or retracting line by lengthening the wraps, said actuating means including means for moving the second line guiding means in a single movement



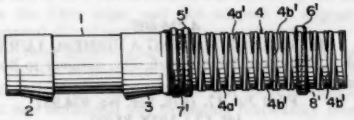
toward and away from the first line guiding means between said fully extended and fully retracted positions.

4,216,603

FISHING REEL SEAT

Hiroshi Takeuchi, Iruma, Japan, assignor to Olympic Fishing Tackles Company, Limited, Saitama, Japan

Continuation of Ser. No. 782,726, Mar. 30, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,047
Claims priority, application Japan, Jun. 14, 1976, 51-77640[U]
Int. Cl.[2] A01K *87/06*
U.S. Cl. 43—22 1 Claim



1. A fishing tackle reel seat comprising:

a hollow, cylindrical main body;

a stationary ring and a moveable ring mounted on said body and having means thereon to grip a fishing reel;

first and second locking nuts for locking said movable ring in engagement with said reel, wherein said first locking nut is mounted on said body between said movable ring and said

second locking nut, and said first locking nut is larger than said second locking nut;

screw thread means formed on the circumferential surface of said body for engagement by said locking nuts;

said screw thread means being a compound thread having a right hand thread and a left hand thread superimposed upon each other, wherein said right hand thread has a different pitch and root width than said left hand thread, the thread root of said right hand thread being wider than the width of said left hand thread and wherein one of said right hand and left hand threads is both discontinuous and completely formed on the crest of the other of said right hand and left hand threads; and

one of said locking nuts having interior, mating right hand threads, and the other said locking nut having interior, mating left hand threads, the threads on said first locking nut and the corresponding threads on the body having a faster pitch than the threads on the second locking nut,

whereby said locking nuts are tightened against said moveable ring in opposite directions, said first locking nut being quickly moveable into engagement with said moveable ring because of said faster thread pitch.

4,216,604

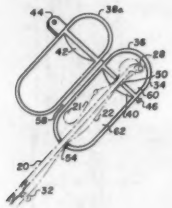
FISHING ROD TIP GUARD

Burnett H. Starke, 1320 E. 9th St., Hutchinson, Kans. 67501

Filed Jan. 22, 1979, Ser. No. 5,569

Int. Cl.³ A01K *87/00, 97/06*

U.S. Cl. 43—25.2 **4 Claims**



1. A guard for protecting the tip of a fishing rod from breakage comprising:

a longitudinal case having inner and outer end walls, and a slot in said inner end wall for receipt of the rod;

a partition laterally positioned in the case having a second slot therein for receipt of the rod, the partition being longitudinally positioned with respect to the slot in the inner end wall of the case;

a longitudinal cover means for the case which closes both of said slots to restrain the rod in the case;

a tip chamber between the partition and said outer end wall of the case for enclosing the tip and preventing any longitudinal movement of the rod in the case; and

means for fastening the cover to the case.

4,216,605

METHOD OF MAKING A FISHING LURE

Joseph S. Showalter, Winter Park, Fla., assignor to Boone Bait Company, Inc., Orlando, Fla.

Filed Jul. 17, 1978, Ser. No. 924,927

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.53 **6 Claims**

1. A method of making a fishing lure comprising the steps of:

barrier coating each of two fishing lure body mold halves;

slipping at least one elongated hollow sleeve onto a mandrel;

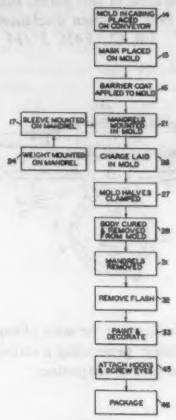
mounting said mandrel to one of said mold halves with said elongated hollow sleeve positioned over the mold half cavity;

charging a mold half cavity with a foam polymer material;

clamping a pair of mold halves together and curing said fishing lure body therein;

removing said fishing lure body from said mold;

removing said mandrel from said lure body; and



attaching at least one screw eye to said lure in said elongated hollow member molded into said lure body through the removed mandrel openings whereby a foam polymer lure is made having reinforced screw eye attachments.

4,216,606

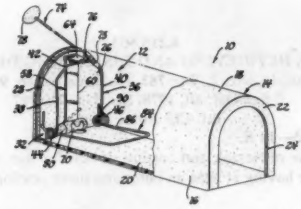
MOUSETRAP

Dennis G. Kaiser, 934 Hillside Dr., and Robert D. Kaiser, 2066 McDivitt Ct., both of Milford, Mich. 48042

Filed Sep. 21, 1978, Ser. No. 944,429

Int. Cl.² A01M *23/30*

U.S. Cl. 43—83 **4 Claims**



1. A trap for mice and other rodents comprising;

a member for providing a passageway of sufficient length to receive and retain a rodent therewithin;

a ground level access provided at one end of said passageway member and a back wall member provided at the other end and for closure thereof,

a spring loaded bail wire trap mechanism mounted wholly upon said passageway member, and said passageway member having enclosing and restrictive wall surfaces sufficiently closely spaced to preclude other than a frontal ground level approach by a rodent attracted into said passageway member and relatively towards said trap mechanism, said passageway member having upper, side and bottom walls providing said enclosing and restrictive wall surfaces and being formed to receive and retain said back wall member in fixed engagement therewith and with said trap mechanism assembled thereon, said back wall member including a pair of spaced projecting por-

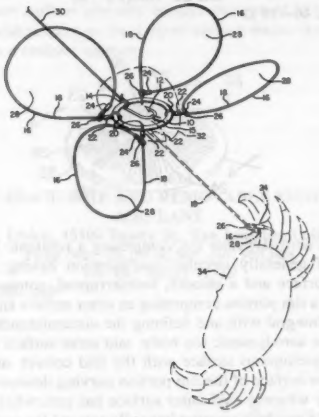
tions disposed near the lower edge of said back wall member, said trap mechanism including a spring loaded bail wire movably mounted on said projecting portions of said back wall member, a bail wire catching member movably mounted on said back wall member and having a weighted end respective of rodent attracting bait, an access notch through said back wall member and a cable connection through said notch and engaged to said bail wire for drawing said bail wire up towards said back wall member and into catching engagement with said catching member, said trap mechanism further including a tripping member movably connected to said projecting portions, said bail wire securing said movable connection and wherein said tripping member moves said catching member out of said catching engagement with the bail wire after a fixed amount of movement by said tripping member.

4,216,607

CRAB-SNARING DEVICE

Edmund F. Lyster, Box 14960, Highway 101 South, Rockaway, Oreg. 97136

Filed Apr. 9, 1979, Ser. No. 28,103
Int. Cl.³ A01K *69/06*
U.S. Cl. 43—87 **2 Claims**



1. A crab snaring device comprising a ring of sufficient weight to facilitate its being cast with a fishing rod;

a plurality of snares mounted on said ring, each comprising a length of relatively stiff, normally straight monofilament line gripping the ring at one end, the other end of each said length being slidably secured to the bight of the respective length of line whereby the tendency of said line to assume its normal, straight condition will cause each said line to maintain an open loop; and

means on said ring for securing a bait thereto.

4,216,608

DOLL HOUSE

Harry E. Walmer, 721 N. Overlook Dr., Alexandria, Va. 22305, and Judd Horbaly, 125 Commonwealth Ave., Alexandria, Va. 22309

Filed Jan. 15, 1979, Ser. No. 3,519
Int. Cl.² A63H *33/52*
U.S. Cl. 46—19 **10 Claims**

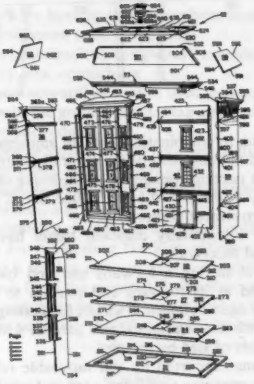
1. An easily assembled knock-down doll house having a bay window assembly and interlocking door assembly, the parts of which are fitted together and held together only with pegs comprising:

a. a generally rectangular first floor member comprising left, right and front grooves in the top surface thereof, at least one intermediate groove in said surface parallel to said left and right grooves, and a series of in-line holes disposed forward of said front groove;

b. a front wall member having a size and shape to have its bottom edge engage said front grooves of said first floor member, comprising a right vertical L-shaped side beam, at least one horizontal beam member disposed on the inner side, a cut out portion in the portion of the front wall adjacent said front grooves of said first floor member at least two holes disposed at the bottom edge and inner front wall edges disposed in the front wall member;

c. a bay window assembly having a size and shape to have its bottom edge engage said front grooves of said first floor member, comprising three non-planar bay front wall members, integral vertical segmented beam members, horizontal top and bottom bay members, a vertical bottom bay member, a left vertical L-shaped beam member and at least one window in each bay front wall member;

d. left and right side walls having respective sizes and shapes to have their front edges engage said L-shaped beams of said front wall member and bay window member and their bottom edges engage said respective left and right grooves of said first floor, each of said side walls containing second, third and fourth inner horizontal beam members having inward side grooves, molding at the top edges and a groove disposed in the molding at the terminus of said top edges;



e. at least one intermediate wall member adapted to have its lower edge engage a respective said intermediate groove in said first floor and a said vertical slot between said front wall member and bay window member, comprising at least one intermediate horizontal slot extending forwardly from the rear edge;

f. a second floor member adapted to have its side edges engage said grooves of said second inner beam members of said side walls and comprising a stairwell near the front edge and at least one horizontal slot extending rearwardly from the front edge, said slot adapted to engage said horizontal slot of said intermediate wall member;

g. a third floor member adapted to have its side edges engage said grooves of said third inner beam members of said side walls and comprising a stairwell near the front edge and at least one horizontal slot extending rearwardly from the front edge, said slot adapted to engage said horizontal slot of said intermediate wall member;

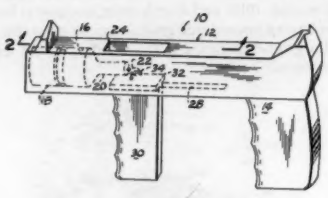
h. a fourth floor member adapted to have its side edges engage said grooves of said fourth inner beam members of said side walls and comprising a stairwell near the front edge and at least one horizontal slot extending rearwardly from the front edge, said slot adapted to engage said horizontal slot of said intermediate wall member;

i. front and left and right roof members disposed with bottom edges in a slanted groove in a molding along the base of the roof, said molding being secured to said front and side wall members, said top roof member having at least one skylight and a chimney;
j. a doorway assembly having side door members with inner grooves, step member, door members, door overhang member and cross member;
k. a continuous front molding adapted to abut and be secured to the front wall member, bay window member and side molding members of the left and right side walls; and
l. a plurality of pegs adapted to be inserted in holes contained in said beams, grooves, wall and floor members at their junctures with each other for retaining said assembled structure together.

4,216,609
TOY GUN

Nilson V. Ortiz, 2911 16th St. ©210, San Francisco, Calif. 94103

Filed Nov. 15, 1978, Ser. No. 960,981
Int. Cl.[2] A63H *35/00*
U.S. Cl. 46—38 **5 Claims**

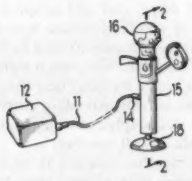


1. A toy gun in combination with an amusement-type novelty item, said novelty item being generally bottle-shaped and having a neck portion containing an explosive charge of powder ignited by a firing cord being pulled out of the neck portion, the improvement comprising:
a normally horizontally disposed barrel having a handle connected therewith,
said barrel having a forward end and having its bore enlarged at its forward end portion to define a forwardly open cylindrical socket for nesting said novelty item with its longitudinal axis parallel with the longitudinal axis of said barrel; and,
trigger means supported by and moveable relative to said barrel for engaging said firing cord and axially withdrawing it from said neck portion.

4,216,610
POP-UP TOY

Michael J. Ferris, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 25, 1979, Ser. No. 6,449
Int. Cl.[3] A63H *29/16*
U.S. Cl. 46—44 **7 Claims**

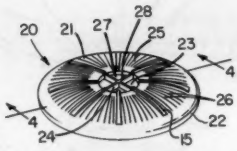


1. A pop-up toy comprising:
a base including an upstanding first stem;
a hollow body having a generally cylindrical bore, mounted for upward and downward sliding movement on said first stem;
a head portion including a second stem extending downwardly into said hollow body mounted for upward and downward sliding therein;
means for pressurizing the interior of said hollow body to elevate said body upwardly on said first stem and elevate said second stem of said head portion upwardly of said body:
means for limiting relative sliding movement between said body and said base including an end wall on the bottom of said body having an aperture for receiving the stem of said base; and
second means for limiting relative sliding movement between said body and said head portion including an end wall on top of said body having an aperture for receiving the stem of said head portion.

4,216,611
AERODYNAMIC TOY

Louis G. Psyras, 1384 Commonwealth Ave., Boston, Mass. 02135

Continuation-in-part of Ser. No. 793,923, May 5, 1977, Pat. No. 4,132,031. This application Nov. 13, 1978, Ser. No. 959,995
Int. Cl.[3] A63H *27/00*
U.S. Cl. 46—74 D **15 Claims**



1. An aeroydynamic toy comprising a rotatable free flight body of generally circular configuration having a convex upper surface and a smooth, uninterrupted, concave bottom surface, a rim portion comprising an outer surface and an inner surface integral with and defining the circumferential perimeter of the aerodynamic toy body, said outer surface forming a smooth continuous surface with the said convex surface and said outer surface of the rim portion curving downwardly and inwardly whereby said outer surface has somewhat the same shape of a parabola opening inwardly toward the center of the circular shaped body, and a plurality of radially extending air spoilers on said convex upper surface disposed equidistant angularly around the geometric center of the aerodynamic toy.

4,216,612
TOY VEHICLE

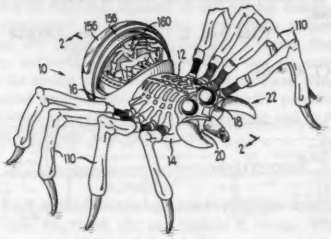
Erick E. Erickson, Chicago; John R. Wildman, North Riverside; Burton C. Meyer, Downers Grove, and Joseph M. Burck, Glenview, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 7, 1978, Ser. No. 967,268
Int. Cl.[3] A63H *11/10*
U.S. Cl. 46—103 **7 Claims**

1. A toy vehicle, generally in the form and shape of a spider, comprising:
a hollow torso portion having a head on its forwardmost end;
a selectively operable drive means within the torso for propelling the same across a suitable supporting surface;
a selectively operable winch means having an extendable tethering line for connection to an object and to provide relative movement with the vehicle upon operation thereof;
a tail portion secured to the end of said torso opposite said head including means defining a cockpit area for an opera-

tor of the vehicle and a movably mounted transparent element closing a generally forwardly directed open portion of said tail;

means defining a plurality of extremities for the spider figure; and



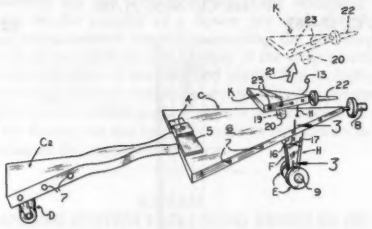
flexible connection means between the extremities and said torso, said flexible connection means being sized according to the mass of the associated extremity to allow a portion of the weight thereof to be supported on the support surface whereby relative movement of said vehicle with respect to the support surface means the extremity in a realistic manner.

4,216,613

TOY SPACE SHIP AND REMOVABLE FIGHTER AIRPLANE

Lester R. Livick, 15106 Beatty St., San Leandro, Calif. 94579

Filed Nov. 22, 1978, Ser. No. 963,088
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—202 **2 Claims**



1. A toy space craft with a hollow body and a transparent undercarriage with wheels for supporting the body when the latter is moved over the ground;

(a) said undercarriage having an elevator shaft in its interior that communicates at its top with the interior of said body and has an opening at its bottom;

(b) an elevator slidably mounted in said shaft and having a string connected to the top of the elevator and extending through the top of the body for permitting the raising and lowering of the elevator in the shaft;

(c) a ramp hingedly connected to the bottom of said undercarriage and swingable from operative position into an inoperative position for closing the opening at the bottom of the elevator shaft; and

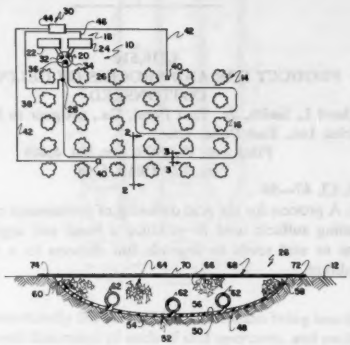
(d) means for swinging said ramp from operative to an inoperative position where it will close the bottom opening to the elevator shaft.

4,216,614

TECHNIQUE FOR HEATING AN AGRICULTURAL AREA

William C. Triplett, Ingleside, Tex., assignor to Triad & Associates, Inc., Robstown, Tex.

Filed Apr. 3, 1978, Ser. No. 892,649
Int. Cl.[2] A01G *13/06*
U.S. Cl. 47—2 **10 Claims**



1. A system for heating the atmosphere close to a ground surface in a cultivated area, comprising

an elongate heat distributing structure extending through the cultivated area, comprising

an elongate upwardly concave shell member disposed in a furrow in the ground and having a pair of spaced generally parallel edges;

at least one elongate conduit received in the shell member and providing an inlet and outlet;

heat absorbing material in the shell member surrounding the conduit; and

means extending at least partially across the spaced shell edges for captivating the heat absorbing material and having a section exposed to the atmosphere for radiating heat from the material to the atmosphere; and

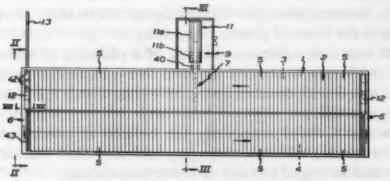
means for supplying relatively warm fluid to the inlet and for receiving relatively cool fluid from the outlet.

4,216,615

HOTHOUSE

Tore S. E. Söderberg, Ågatan 16, and Kenneth J. Jonsson, Åkervä/ gen 7, both of S-361 00 Emmaboda, Sweden

Filed Feb. 28, 1979, Ser. No. 16,306
Claims priority, application Sweden, Mar. 3, 1978, 7802433
Int. Cl.[2] A01G *9/00*
U.S. Cl. 47—17 **17 Claims**



1. A hothouse, primarily intended for the cultivation of tomatoes or lettuce, comprising

(a) at least two corridors, the ends of one corridor being adjacent the ends of the other corridor,

(b) a plurality of cultivation wagons in adjacent relationship in each said corridor,

(c) transfer means at the adjacent ends of said corridors for

transferring cultivation wagons from one corridor to a corridor adjacent thereto,

(d) a plant treatment area adjacent to at least one said corridor, and

(e) transfer means for transferring cultivation wagons between said plant treatment area and said adjacent corridor.

4,216,616

PRODUCT FOR AND PROCESS OF DELINTING COTTONSEED

Richard L. Smith, Jr., East Point, Ga., assignor to SSC Industries, Inc., East Point, Ga.

Filed Jan. 18, 1979, Ser. No. 4,408
Int. Cl.[2] D01B *1/04*
U.S. Cl. 47—58 **18 Claims**

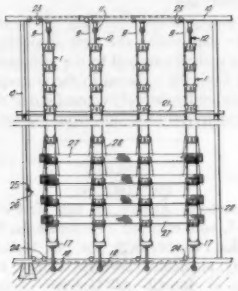
1. A process for the acid delinting of cottonseeds comprising foaming sulfuric acid to produce a foam and applying said foam to said seeds to degrade lint thereon to a removable condition.

4,216,617

INSTALLATION AND METHOD FOR VEGETABLE CULTIVATION

Maria Schmidt, Grottaferrata, Italy, assignor to Inzuki Buero Fuer Technische Projekte und Patente Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 27, 1979, Ser. No. 15,594
Claims priority, application Italy, Feb. 27, 1978, 48209 A/78
Int. Cl.[2] A01G *31/02*
U.S. Cl. 47—62 **6 Claims**



1. An installation for the hydroponic cultivation of vegetables in the form of plants, comprising:

at least one column consisting of a plurality of bottomless hollow containers **1** inserted one into another and provided with suitable apertures **4** into which the plants are inserted;

means **8**, **9** for supporting the column of containers in a vertical position by engaging each container individually, and arranged to raise or lower said column;

means **14**, **15** for spraying at the top of the column a nutrient liquid of known type as usually used in hydroponic cultivation;

basin-type support means **17** for collecting said liquid at the base of each column, and at the same time supporting this latter;

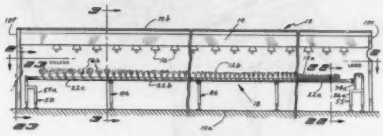
manifold means **19** for the liquid and pumping means **20** for its recycling.

4,216,618

METHOD AND APPARATUS FOR INCREASING THE SPACING BETWEEN PLANTS IN ACCORDANCE WITH THEIR GROWTH RATE

John T. Haub, Maple Grove; James G. Krassas, Plymouth; Stanley C. Rustad, Golden Valley, and Noel Davis, Wayzata, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Aug. 2, 1978, Ser. No. 930,448
Int. Cl.[2] A01G *31/02*
U.S. Cl. 47—65 **61 Claims**



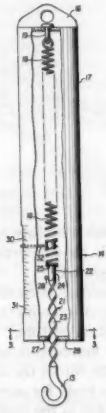
60. A method of growing plants at first, second and third locations, said third location being spaced from said first location and said second location being between said first and third locations, the method comprising the steps of arranging certain of the plants to be grown in a first number of parallel rows at said first location, moving said first number of parallel plant rows from said first growing location to said second growing location and increasing the distance between said rows during the movement thereof while maintaining said rows parallel, and again moving said first number of parallel plants rows from said second growing location to said third growing location and further increasing the distance between said same rows during the movement thereof between said second and third locations.

4,216,619

HORTICULTURE DEVICE FOR ROTATING PLANTS DUE TO TRANSPIRATION AND EVAPORATION OF MOISTURE

Calvin L. Espy, 2203 Riverbrook Rd., Decatur, Ga. 30035

Filed Feb. 14, 1979, Ser. No. 12,078
Int. Cl.[2] A01C *11/00*
U.S. Cl. 47—67 **12 Claims**



1. A horticulture device for rotating a plant container and its contents, the device comprising:

a support;

spring means distortable by the weight of the container;

means for mounting the spring means on the support in a configuration such that the spring means supports and is

distorted by the gravitational force of the plant container and its contents;

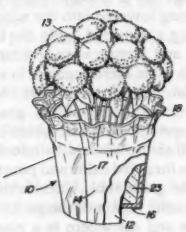
means for rotating said plant container and its contents simultaneously with distortion of said spring means said rotating means including means attached to the spring means for converting linear motion to rotary motion upon a change in the gravitational force from the plant container and its contents applied to the spring means, and means connected to the motion converting means for attaching the plant container and its contents thereto, whereby watering the plant container and its contents distorts the spring means from an initial state and whereby evaporation and transpiration of the water permits the spring means to be restored to its initial state and to rotate the plant container and its contents.

4,216,620

FLOWER POT WRAP WITH LACE PATTERN EDGING

Erwin H. Weder, Highland, Ill., and Donald E. Weder, Hobart, Okla., assignors to Highland Supply Corporation, Highland, Ill.

Filed Dec. 1, 1976, Ser. No. 746,635
Int. Cl.[2] B65D *65/10, 65/18*
U.S. Cl. 47—72 **5 Claims**



1. A flower pot wrap comprising a planar panel of flexible, shape sustaining metallic foil and a planar panel of flexible, non-shape sustaining plastic film laminated to said metallic foil panel whereby the pot wrap becomes shape sustaining for positioning on the exterior of a flower pot with the shape sustaining characteristics thereof maintaining the pot wrap in position on the pot with an edge portion of the wrap generally aligned with the edge of the pot, said plastic film including a lace pattern edge portion extending beyond the edge portion of the metallic foil for defining a lace pattern collar above the top edge of the flower pot and below blooms on the flowers in the pot to enhance the appearance thereof.

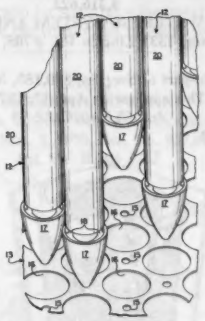
4,216,621

PLANTING SYSTEM INCLUDING ARTICLES OF MANUFACTURE

Robert C. Olsen, Streamwood, and Bryant Edwards, Clarendon Hills, both of Ill., assignors to Illinois Tool Works, Inc., Chicago, Ill.

Division of Ser. No. 869,728, Jan. 16, 1978, Pat. No. 4,159,597, which is a continuation-in-part of Ser. No. 773,027, Feb. 28, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,500
Int. Cl.[2] A01C *11/02*
U.S. Cl. 47—73 **3 Claims**

1. In a planting system having a plurality of plant growing containers in which each container comprises a base section having a downwardly and inwardly tapered generally cone shaped outer surface, an improved arrangement for releasably carrying said plurality of containers by the base sections thereof as a flexible unit and in substantially self-righting attitudes comprising a sheet of flexible elastic material having a plurality of apertures therein arranged in a plurality of substantially parallel rows, radially outwardly extending shoulder means formed on the outer surface of the base section of each of said containers, said shoulder means disposed on each of said base sections substantially above the lower end thereof and disposed circumferentially thereabout in a plane perpendicular to the longitudinal axis of each of said containers, the circumferential dimension of the outer surface of each of said base



sections immediately above said shoulder means being less than the peripheral dimension of each of said apertures, and each of said base sections of each of said containers inserted in one of said apertures to upstand from said sheet and with the material about each aperture in a stretched condition against the outer surface of each base section immediately above said shoulder means.

4,216,622

PLANT CONTAINER

Roger C. Hollenbach, 20 Hodge Rd., Kendall Park, N.J. 08824, and Howard U. Hackney, Jr., 24 Jefferson Dr., Flanders, N.J. 07836

Filed Sep. 19, 1978, Ser. No. 943,689
Int. Cl.[3] A01G *9/04, 9/10*
U.S. Cl. 47—71 **6 Claims**

1. A plant container molded from a thermoplastic polymer and comprising a generally tubular vertical wall, an integral bottom wall and a portion of a wall being of lesser thickness constituting a living hinge coextensive with the wall, the vertical wall having a slit along at least one side, an outwardly extending cylindroid bead integral with said vertical wall along one slit edge, the opposed slit edge having a cooperating cylindroid groove, the dimension between the lips of said groove being smaller than the diameter of said bead and adapted to receive said bead and form a liquid-tight separable closure, said living hinge permitting said bead to be withdrawn from said groove and said slit edges to be separated, said bottom wall having a centrally located drainage port therein and having at least one concentric circular area defined by a ring of lesser thickness than said bottom wall molded into said bottom wall whereby said circular area may be pressed from said bottom wall, a tubular base integral with and extending downwardly from said bottom wall, the tubular base having an annular flute in its exterior surface, the tubular base being

adapted to be positioned in a cup-shaped tray having upwardly projecting sectors, the internal diameter of said sectors being greater than the external diameter of said tubular base, said sectors having a bead on the internal surface of said sectors, the beads being adapted to register with said flute in said base.

4,216,623

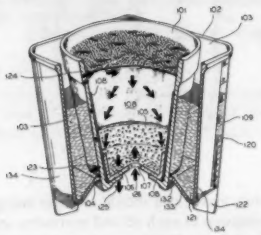
PLANT WATERING SYSTEM AND PROCESS

Stanley M. Silver, 1331 Lincoln Rd. #705, Miami Beach, Fla. 33319

Continuation-in-part of Ser. No. 800,185, May 25, 1977, Pat. No. 4,096,663. This application Apr. 17, 1978, Ser. No. 896,753

Int. Cl.[2] A01G *27/00*

U.S. Cl. 47—80 **1 Claim**



1. A suspendable, plant-watering container for maintaining moisture/oxygen balance for roots of varied plant species, said container comprising means for aerating lower roots of said plant, said means including a container which is double walled at least in part and having an outer wall having a bottom comprising an aperture and an inner wall having at least one drainage hole leading directly to the ambient atmosphere at the bottom of the container, the space between said double walls forming a water-containing reservoir for receiving and holding water, the inner of said walls being a frusto-conical clay pot with said drainage hole in its bottom region; the outside diameter of the lower portion of said clay pot being no greater than the inside diameter of said aperture, said clay pot to be retained when inserted through said aperture, walls of said pot providing for the vertical wicking of moisture, said pot walls having at least 10% porosity for providing a moisture transmission capability, moisture-resisting means for precluding transfer of moisture from said reservoir directly through the walls of the pot and into a porous growing medium contained within said pot beneath a predetermined level while enabling said moisture to wick upwardly through said walls to a level above said predetermined level to moisten by capillarity the top 25–30% portion of said porous growing medium, whereby when said porous growing medium is wetted by said upwardly wicked water the upper portion of the growing medium being wetted to a percentage of water which results in a gravitational flow of water sufficient for a substantially even distribution of moisture inwardly and downwardly through the said growing medium, the outer wall providing a pot-bracing and orientation means extending inwardly from the outer wall, an exterior lower portion of the pot wall sitting within and protruding beneath a hole in a base wall of said water-containing reservoir means with a non-removable, waterproof, adhesive joint at the interface between said pot means and said outer wall, said joint being non-dislocatable by the levering of said pot and means whereby gases may enter and leave said porous growing medium through said drain hole, wherein water is prevented from dripping from such hole under normal watering conditions provided by said upwardly wicked water, said water evaporating to a lesser wetness by enhanced ventilation through at least the drainage portion of said clay pot which is inserted through said aperture, said water being held in place by capillary force.

4,216,624

WINDOW WINDER FOR SLIDABLE WINDOWS, ESPECIALLY FOR AUTOMOBILES

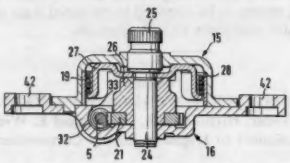
Heinz Blankenburg, Frankfurt am Main; Peter Schafer, Bruchköbel, and Friedrich Herrmann, Maintal, all of Fed. Rep. of Germany, assignors to Rockwell-Golde, G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,523

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1978, 2812314

Int. Cl.[2] F16H *27/02*

U.S. Cl. 49—352 **8 Claims**



1. A window winder for a slidable window, especially a window capable of being lowered into the window shaft of an automobile, comprising a threaded cable displaceably guided in a tension-resistant and compression-resistant manner in a guide tube, with which cable there engages, in a two-part drive casing, the drive pinion non-rotatably keyed to a drive shaft journalled in the two half-casings of a gear wheel drive equipped with a drag spring brake, and which cable is directly or indirectly connected to the window by one or more extraining devices fixed to the threaded cable and penetrating through a longitudinal slit in the guide tube, wherein the guide tube is a slit metal tube only in the region of the path of movement of the entraining devices and elsewhere is a plastics tube connected to the drive casing and the metal tube in a non-displacing, non-rotatable manner by means of sleeves injection moulded onto the plastics tube characterized in that the two parts (**15, 16**) of the drive casing (**1**) are injection moulded from plastics material and that their parting plane (**17**) is situated outside the threaded cable (**5**) passing through the casing and outside the drive pinion (**21**), between the drive pinion and the drag spring brake (**28**), whereby a guide duct (**32**), guiding the threaded cable and substantially in alignment with the internal surface of the guide tube (**6, 8**) and open towards the drive pinion and towards the parting plane, is disposed in one casing part (**16**), and that of the sleeves (**29, 30**) situated on the casing each is formed on and therefore formed in one piece with one casing part.

4,216,625

WELL PUMP STRIPPING TOOL

Harry E. Jenks, P.O. Box 742, Elkhart, Kans. 67950

Filed Jun. 15, 1978, Ser. No. 915,789

Int. Cl.[2] B24B *41/02*

U.S. Cl. 51—34 G **5 Claims**

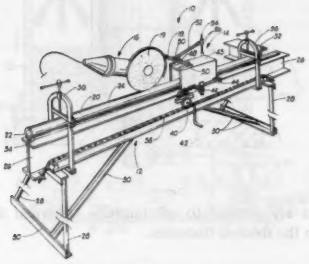
1. A well pump stripping tool for removing a pump barrel surrounding a plunger, the tool comprising:

an elongated stand including an "I" beam mounted on stand legs and a "V" shaped pipe guide attached to the top of the "I" beam and extending along the length thereof, the pipe guide adapted for receiving and holding the plunger and pump barrel thereon;

an inverted "U" shaped trolley, the trolley having trolley wheels riding on the top and the bottom of the upper portion of the "I" beam, the wheels guiding the trolley along the length of the top of the "I" beam and straddling the pump barrel and plunger thereon;

a grinder having a grinder wheel and a grinder holder, the grinder holder attached to a pivot shaft mounted on top of the trolley, the holder also attached to a pivot adjustment

arm, the arm vertically adjustable on top of the trolley, by adjusting the arm the holder is pivoted on the pivot shaft thereby adjusting the vertical movement of the grinder wheel which is suspended above the pump barrel so that the proper depth of slot is cut along the length of the



pump barrel as the grinder wheel is guided along the length of the pump barrel; and

drive means attached to the trolley and the "I" beam for moving the trolley on top of the "I" beam and along the length thereof.

4,216,626

MACHINE FOR GRINDING AND POLISHING WORKPIECES

Franz Starp, Wildbad, Fed. Rep. of Germany, assignor to Prontor-Werk Alfred Gauthier G.m.b.H., Wildbad, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,493

Claims priority, application Fed. Rep. of Germany, May 13, 1977, 2721553

Int. Cl.[2] B24B *13/02*

U.S. Cl. 51—58 **20 Claims**

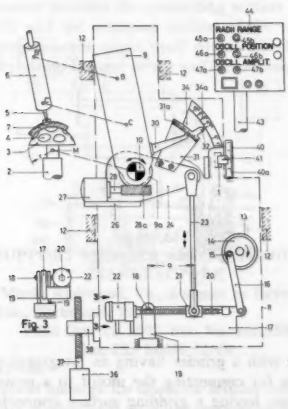


Fig. 3

1. Machine for grinding and polishing workpieces having a spherical surface, such as spectacle glasses, lenses, and the like, including a workpiece support disposed for rotation about an axis for mounting the workpiece for exposure during the machining operation to the action of a work tool applied under pressure against the workpiece, a pressure spindle sleeve for holding the work tool for carrying out such action, a rocker connected to the pressure spindle sleeve and mounted for reciprocating movement about an axis of pivot arranged normal to the axis of rotation of the workpiece support, the rotation axis of the workpiece support lying in a first plane and the pivot axis of the rocker lying in a second plane parallel to and disposed at a fixed distance from the first plane, and a crank drive for effecting reciprocating movement of the rocker and in turn of the pressure spindle sleeve, in which the crank drive is provided with crank arm means having an invariable operative crank radius and in which an intermediate drive means is disposed operatively between the crank arm means of the crank drive and the rocker which has a variable operative drive transmission ratio for selective adjustment of the reciprocating movement of the rocker and pressure spindle sleeve.

4,216,627

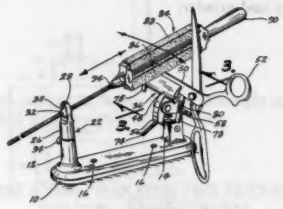
SHEAR SHARPENER

Stanley J. Westrom, 25 NW. 44th Ave., Des Moines, Iowa

Filed Nov. 2, 1978, Ser. No. 957,015

Int. Cl.[3] B24B *3/52*

U.S. Cl. 51—69 **4 Claims**



1. A shear sharpener, comprising: a horizontally elongated base having first and second upwardly opening socket means spaced apart lengthwise of said base; swivel means having a lower part depending into and received by the first socket means and an upper part fixed to and rising from said lower part, said upper part including a swivel element mounted for movement about a plurality of intersecting axes and having a through opening on an axis spaced above the base; vise means including a post depending into and received by the second socket means, a fixed jaw rigid with and rising from the post, a movable jaw cooperative with the first jaw for receiving a shear blade between them and clamp means selectively operative to close and open the jaws; means for securely locking the vise means to the base via said post and second socket means with the jaws transverse to the base; and hone means disposed above the vise means and including a shaft slidably received by the opening in the swivel element, at least one honing stone fixed to the shaft as an elongation thereof, and a handle attached to the stone for manual reciprocation of the hone means across a shear blade held by the vise means, said swivel enabling said reciprocation of the hone means as well as movement of said hone means transversely of the base and also enabling vertical movement of the hone means relative to the vise for lifting of the hone means clear of the vise; and wherein the means for locking the vise means post to the base includes an opening in the base transverse to said second socket means and a releasable locking element received in said opening and having a key-way embracing the vise means post within said socket means.

4,216,628

DEVICE FOR AUTOMATICALLY GRINDING SYRINGE NEEDLE POINT

Shoji Wada, 11-22, Katase Kaigan 2-chome, Fujisawa-shi, Kanagawa-ken, Japan

Filed Oct. 2, 1978, Ser. No. 947,503

Claims priority, application Japan, Oct. 21, 1977, 52/125789

Int. Cl.[2] B24B *19/16*

U.S. Cl. 51—98.5 **17 Claims**

1. An automatic grinder device for grinding a syringe needle point, said grinder device comprising:

tube holder means for supporting in parallel alignment a plurality of syringe needle tubes, said tube holder means

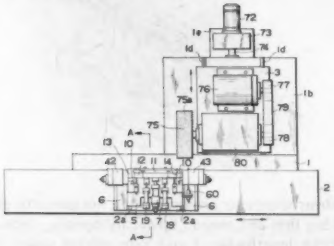
comprising two holding plates for clamping therebetween the tubes;

a grinder having a grinding surface positioned adjacent said tube holder means and spaced therefrom by a spacing;

support angle changer means for changing the position of said tube holder means and thereby the angle at which tubes supported by said tube holder means extend toward said grinding surface of said grinder;

rotation means for changing the rotational angular alignment of tubes supported by said tube holder means by rotating the tubes about their longitudinal axes, said rotation means comprising means for moving at least one of said holding plates in a longitudinal direction across tubes held between said holding plates;

said tube holder means further including tube height adjusting means, provided on one of said holding plates at an end thereof at which tubes supported thereby are pressed by said grinder, for adjusting the pressure exerted on the tubes by said grinder;



said tube holder means further including space adjusting means for separating said two holding plates by an adjustable predetermined distance, to thereby enable said tube holder means to accommodate tubes of varying diameter;

grinding volume changer means for moving said grinder across said spacing toward tubes supported by said tube holder means by relatively greater or lesser amounts in accordance with a predetermined volume to be ground from the tubes;

reciprocater means for reciprocating said tube holder means and tubes supported thereby across said grinding surface of said grinder in a direction such that all of the tubes are sequentially and equally ground by said grinding surface;

space adjuster means for determining changes in said spacing due to wear of said grinder and for causing said grinding volume changer means to move said grinder toward said tube holder means until said spacing is corrected to a predetermined value; and

grinding control means for controlling the sequence of operation of the above-mentioned said means in accordance with a predetermined program.

4,216,629

METHOD AND APPARATUS FOR PRODUCING BALLS

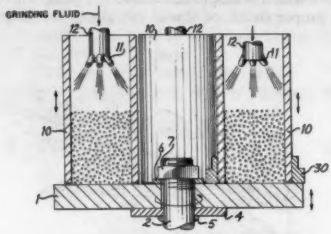
Albert M. DeGaeta, 10 Patriot Dr., Gladstone, N.J.

Filed Sep. 15, 1978, Ser. No. 942,632

Int. Cl.[2] B24B *11/02*

U.S. Cl. 51—125 **22 Claims**

1. Apparatus for producing generally spherical balls from non-spherical blanks which comprises a grinding disc having a generally horizontal plane abrasive upper surface, at least one generally vertical stationary tube positioned eccentrically above said disc with its lower end very close to but spaced slightly from the upper face of said disc to receive a multiplicity of said blanks partially filling said tube to a depth many times the cross sectional dimension of said blanks, the height of said tube being greater than its cross sectional dimension, means for rotating said disc at selected speed about a generally vertical axis to grind and tumble said blanks in said tube and to produce circulation of said blanks in said tube continually to bring different blanks and different surfaces of said blanks into contact with said abrasive surface of said disc whereby all of



said blanks are ground to substantially spherical shape and reduced to the desired diameter.

4,216,630

GRINDER APPARATUS WITH POLLUTION CONTROL FLUID DISPENSING MEANS

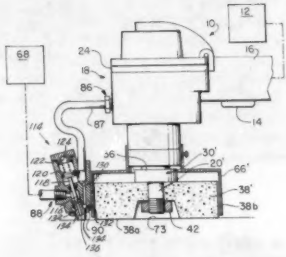
William L. Smart, Indianapolis, Ind.; Stuart A. Hoenig, Tucson, Ariz.; Christian W. Savitz, Tucson, Ariz., and Douglas K. Darlington, Tucson, Ariz., assignors to The Aro Corporation, Bryan, Ohio

Continuation of Ser. No. 827,459, Aug. 25, 1977, Pat. No. 4,129,966. This application Oct. 11, 1978, Ser. No. 950,412

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.[2] B24B *23/00, 55/02*

U.S. Cl. 51—170 T **1 Claim**



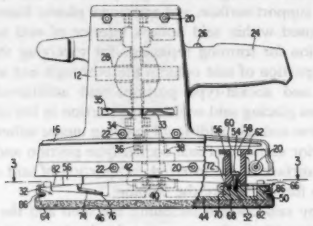
1. For use with a grinder having an integrated pneumatic motor, means for connecting the motor to a power source, grinding means having a grinding surface connected to and driven by the motor, means for providing a stream of pollution control fluid to the grinder, and means for atomizing and dispensing the stream of pollution control fluid adjacent the grinding surface to capture particulate contaminates generated during grinding operations, the improvement comprising means for dispensing the atomized pollution control fluid with a dispensing gas wherein the dispensing gas is first passed through the pneumatic motor at a first superatmospheric pressure to cause rotation of the shaft, is then exhausted from the motor at a second, relatively lower superatmospheric pressure, and is dispensed with the pollution control fluid in the dispensing means at this second pressure.

4,216,631

PAPER CLAMPING DEVICE FOR SANDING MACHINE

Richard N. Ryer, II, Cleveland, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 25, 1979, Ser. No. 6,395
Int. Cl.[2] B24D *17/00*
U.S. Cl. 51—170 MT **7 Claims**



1. In a power driven, portable surface treating machine, a mechanism for clamping a surface treating material to the back plate of the surface treating machine, comprising:

a back plate having a clamp seat at one end thereof extending horizontally across substantially the entire length of said one end of said back plate; and

a device for clamping one end of the surface treating material, said clamping device having a manipulative over-center toggle lever pivotably supported on said back plate, said lever having a power arm section having a finger grip at its rear and a toggle arm section offset laterally from the forward end of the power arm section, and a reciprocably shiftable, resilient wire clamping member having a connecting section substantially perpendicular to and pivotably mounted on the toggle arm section of the lever and a clamping section fixedly secured to the connecting section and extending substantially parallel to the clamp seat in the back plate, whereby when the lever is moved to its over-center position the connecting section moves horizontally and the clamping section of the resilient wire clamping member aligns itself within the clamp seat to thereby clamp the end of the surface treating material.

4,216,632

SUPPORT MEMBER AND METHOD OF MANUFACTURE

Grant V. Mack, Richmond, Va., assignor to Reynolds International, Inc., Richmond, Va.

Filed Oct. 11, 1978, Ser. No. 950,355
Int. Cl.[3] E04H *12/08*
U.S. Cl. 52—40 **12 Claims**

1. A support member for disparate articles comprising:

a plurality of elongated strip-like sections coupled together by a plurality of separator-fasteners;

said separator-fasteners being operative to space said sections from one another to form an open frame having an elongate configuration and openings therein;

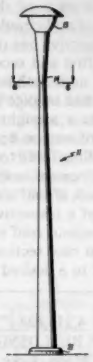
said open frame including fairing channels;

fairing inserts adapted to be slidably inserted into said openings for closing said open frame; and

wherein each of said section includes: an outer surface which extends the length of said section;

said outer surface having longitudinal edges with slots that extend the length of said section;

a web portion extending radially inwardly from the approximate center of said outer surface; and



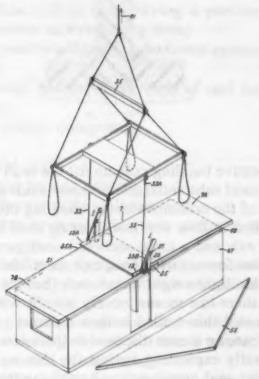
said web portion including means to couple said strip-like sections to said separator-fasteners.

4,216,633

PROCESS AND APPARATUS FOR ELEVATING A FOLDING ROOF SYSTEM

Edward C. Grauer, Lansdale, and William H. Kennedy, Wyncote, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed May 11, 1978, Ser. No. 905,069
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—122 **5 Claims**



1. A lifting apparatus for elevating first and second roof sections which comprises:

(a) a first pair of lifting means, wherein each of said first pair includes at one end thereof circular means adaptable for rotatively engaging different sides of said first roof section and for transmitting a pulling force, and each of said first pair further including locking means at another end thereof;

(b) a second pair of lifting means, wherein each of said second pair includes at a first end thereof means adaptable for rotatively engaging different sides of said second roof section, and each of said second pair further including means pivotally connecting a second end thereof to a respective one of said first pair at a point intermediate said one and other ends thereof

(c) a hoist means; and

(d) flexible means extending from said second end of each of said second pair around said circular means at said one end of a respective one of said first pair to said hoist means, whereby upon application of the pulling force to said flexible means, each of said circular means begins to rotate upwards about a respective one of said second end of said second pair as said first and second pair rotate out of a folded configuration until each said locking means rotates downward to clasp and engage a respective one of said second pair to form a straight configuration, thereby moving said first roof section upward, and upon further application of the pulling force to said flexible means, said first and second pair remain in the straight configuration as said first end of each of said second pair rotate upward about said one end of a respective one of said first pair, thereby lifting said second roof section while continuing the lifting of said first roof section until both of said roof sections are elevated to a desired pitch.

4,216,634

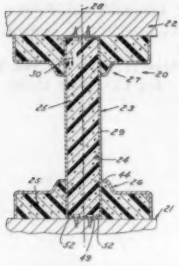
COMPOSITE BUILDING COLUMN

Burton A. Binder, 3093 Moon Lake Rd., West Bloomfield, Mich. 48033

Continuation of Ser. No. 878,280, Feb. 16, 1978, abandoned, which is a continuation-in-part of Ser. No. 726,825, Sep. 27, 1976, abandoned. This application Jul. 2, 1979, Ser. No. 54,346

Int. Cl.[3] **E04C** *1/00;* **E04H** *12/00;* **E04C** *3/30*

U.S. Cl. 52—309.9 **5 Claims**



1. A decorative building column for use with houses and the like to withstand substantial compression loads along the longitudinal axis of the column without buckling comprising:

a thin-walled hollow non-load-bearing shell having a longitudinal axis and a cross-sectional configuration of a first dimension formed of at least one sheet-like means of relatively thin lightweight metal such that the edge portions of said sheet-like means loosely interfit with one another to form said thin-walled hollow column;

a plastic foaming means disposed in the interior of said shell for laterally expanding against the thin wall for laterally expanding said cross-sectional configuration of said thin-walled hollow shell to a second dimension slightly greater than said first dimension for placing said shell in laterally outward tension, the lateral expanding of said plastic automatically positively locks the edge portions of said sheet-like means along a longitudinal seam and the expanding plastic adheres to the interior walls of said shell, said second dimension exceeds said first dimension by about two to four percent;

a substantially hollow, socket-type portion having a central aperture therein adapted to retainably receive one end of said building column therethrough, said socket-type portion shaped so as to have a top surface portion and side walls integral therewith and extending therefrom so as to form a generally hollow central portion, said central aperture dimensioned to corespond to the cross-sectional configuration of the end portion of said building column adapted to be received therethrough, said socket-type portion further includes a substantially dish-shaped disk of relatively thin lightweight metal, a rim portion of said dish-shaped disk being adapted to be received within the end portion of said building column which is received within said socket-type portion, anchoring means adapted to retainably secure the dish-shaped disk in a predetermined position on a support surface for retainably securing said building column in a predetermined position on said support surface, and additional plastic foaming means disposed within said hollow interior of said socket-type portion for forming a passage for receiving the inserted end portion of said column therethrough and strengthening said socket-type portion, said additional foaming means placing said socket-type portion in lateral outward tension and said additional foaming means adhering to the interior surfaces of said socket-type portion and the exterior surface of the inserted end portion of said column so as to further secure the column;

whereby said column including the shell and the foamable plastic withstand compression loads along said longitudinal axis without buckling said shell and without crumbling said plastic.

4,216,635

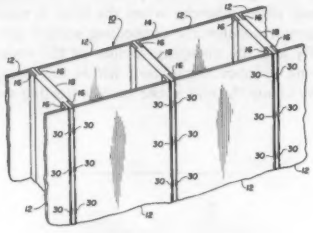
HOLLOW PANEL STRUCTURE AND METHOD FOR THE CONSTRUCTION THEREOF

Roger D. Ratliff, Irving, Tex., assignor to PepsiCo, Inc., Purchase, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,299

Int. Cl.[2] **E04B** *5/52*

U.S. Cl. 52—481 **12 Claims**



1. A method of constructing a hollow panel structure applicable as a wall partition, divider member and the like, comprising the steps of:

(a) positioning a plurality of generally channel-shaped elements each having a substantially flat central portion and upstanding flange portions along the opposite longitudinal edges thereof in two parallel spaced rows with the flange portions of the opposite rows extending towards each other;

(b) interposing spacer elements between said two rows of channel-shaped elements, the end portions of each spacer element extending intermediate adjoining flange portions of adjacent channel-shaped elements, said spacer elements having recess surface portions formed in the opposite end regions thereof, the flange portions of said channel-shaped elements being matingly received in corresponding of said recesses;

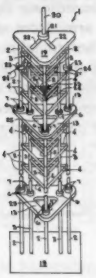
(c) and fastening said channel-shaped elements to said spacer elements to thereby form a rigid, essentially box-like hollow panel structure.

4,216,636

TOWER

Jack R. Cordell, 648 Seneca Trail, Shreveport, La. 71107

Filed Dec. 12, 1977, Ser. No. 859,371
Int. Cl.[2] F04N *12/00*
U.S. Cl. 52—637 **6 Claims**



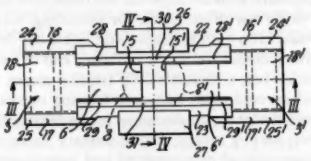
1. A tower comprising:
(a) a set of three vertically disposed outside legs positioned generally in the shape of a first triangle;
(b) a set of three vertically disposed inside legs spaced from said outside legs and positioned generally in the shape of a second triangle and oriented inside said first triangle;
(c) a plurality of generally horizontally disposed collars shaped generally in the form of a triangle and having spaced apertures for carrying said outside legs and said inside legs in spaced relationship near the apexes of said triangle at selected points along the length of said tower; and
(d) leg flanges provided on said outside legs and said inside legs on each side of said collars, respectively, to join sections of said outside legs and said inside legs, respectively, with the ends of said outside legs and said inside legs projecting beyond said leg flanges for registration with said spaced apertures in said collars.

4,216,637

MOLDING RETAINER

Willibald Kraus, Kaiserslautern, Fed. Rep. of Germany, assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 28, 1978, Ser. No. 937,654
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2739889; Jan. 20, 1978, 7801639[U]
Int. Cl.[2] E04F *19/02*
U.S. Cl. 52—718 **42 Claims**



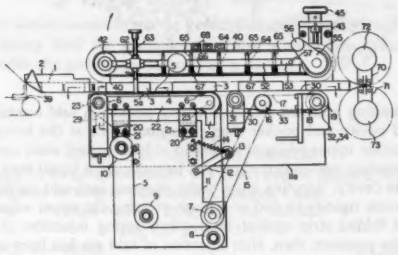
1. A clip for mounting an article on a support which has an upstanding headed stud, the clip comprising an open channel extending continuously through the clip from end to end whereby the clip can be slidably mounted on the stud from either end of the clip, the channel defining a retention area intermediate the length of the channel and two insertion areas, at least one resilient element having an abutment which is resiliently urged against the head of the stud when the clip is mounted on the stud and the head of the stud is in the retention area, the abutment being adapted to resist withdrawal of the stud from the retention area, the channel being generally of inverted U-shape in cross-section and being defined by side walls and a web formed at least partly by the resilient element, and connecting ribs which define the side walls proximate the retaining area and extend from one insertion area to the other.

4,216,638

WRAPPING MACHINE

Toshio Yoshida, Kanagawa, Japan, assignor to Toyo Syokuhin Kikai Kabushiki Kaisya, Kanagawa, Japan

Filed Apr. 10, 1978, Ser. No. 895,226
Claims priority, application Japan, Mar. 3, 1978, 53-24670
Int. Cl.[2] B65B *51/18*
U.S. Cl. 156—466 **3 Claims**



1. A wrapping maching comprising:
forming means for forming a film strip into a tube with a seam;
a pair of horizontally adjacent receiving belts for receiving the formed film strip;
an elongated heat sealing band having a portion disposed coplanar between said receiving belts;
a press belt adapted to press said tube forms against said heat sealing band;
a pair of electrode pulleys at the ends of said heat sealing band portion;
said electrode pulleys comprising;
a shaft;
a bearing on said shaft;
an insulating ring on said bearing;
a conductive ring on said insulating ring;
a slip element between said electrode and said conducting ring;
electrode means for applying an electric current through said pulleys to said coplanar portion of said heat sealing band;
said heat sealing band passing over said conductive rings on said pulleys whereby electric current is conducted to the heat sealing portion of said band;
whereby said heat sealing band seals the seam on said film tube.

4,216,639

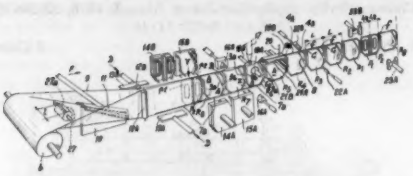
PROCESS OF MAKING CONTAINERS MADE OF THIN PLIABLE SYNTHETIC MATERIAL

Raoul L. A. Gautier, Vittel, France, assignor to Societe Generale des Eaux Minerales de Vittel, Vittel, France

Filed Feb. 12, 1979, Ser. No. 11,066
Claims priority, application France, Feb. 15, 1978, 78 04233
Int. Cl.[2] B65B *61/14, 43/04*
U.S. Cl. 53—413 **11 Claims**

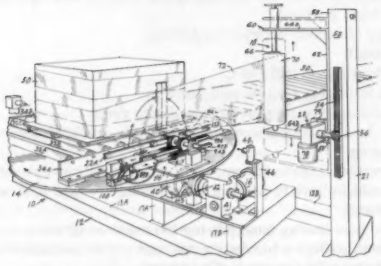
1. A process for the continuous manufacture of identical containers with handles in a thin and pliable composite synthetic material heat-weldable on one face only, which process consists in: advancing horizontally in a stepwise manner a strip of composite material folded longitudinally to the shape of a

letter W, each feed step being a little greater than the width of each container to be produced or than a multiple of its width, and, to produce at least one container between each two successive feed steps, simultaneously welding the bottoms of the two V-shaped folds in said strip; making a first and second weld, extending transversely of said strip and separated by a distance corresponding to the required width of each container to be manufactured, and interconnecting the inner faces of said folded strip and of its two V-shaped folds; making a third weld, delimiting, together with the first weld, a main cavity in the container to be produced and, together with said second weld,



delimiting a closed handle forming pocket in said container, said cavity and pocket then remaining open at the brought-together upper edges of said strip at least at said main cavity; separating said upper edges and introducing a liquid into said main cavity; injecting a gas under pressure into said pocket to provide rigidity to said container; pressing the upper edges of said folded strip against each other during injection of gas under pressure; then, after injection of said gas has been completed, welding together the upper edges of said folded strip so as to close said main cavity and said pocket, said pocket thereby forming a permanently sealed handle.

4,216,640
UNIT LOAD WRAPPING MACHINE
Charles R. Kaufman, 6728 Santo La., Maumee, Ohio 43537
Filed Jun. 12, 1978, Ser. No. 914,938
Int. Cl.[3] B65B *11/04*
U.S. Cl. 53—556 **2 Claims**



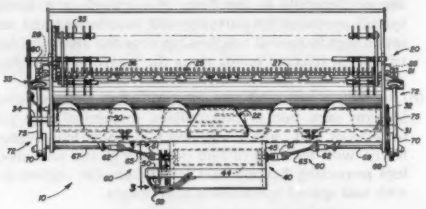
2. In a stretch wrapping machine for wrapping a bundle on a loading platform in which said wrapping machine includes a base, a spool for wrapping material, a rotatable and horizontally disposed platform for holding the bundle while it is being wrapped, and means to hold and cut said wrapping material at various positions and at various intervals, the improvement comprising the following elements:

(a) a pair of rotatable longitudinal extending holding arm members rotatable relative to one another from, diametrically opposing positions about a common axis to a mutually aligned position against one another and wherein said axis of said arms is mounted on and located beneath the level of the horizontal platform, and wherein said arms are mutually opposed in rotatable movement on said common axis, means for pivotally moving one of said rotatable arms in a ninety degree arcuate movement between a first horizontal position below the platform to a vertical position relative to the horizontal loading platform and means for pivotally moving the second of said arms in an arcuate movement between said first horizontal position and a second horizontal position diametrically opposed to said first horizontal position;

(b) cutting means integrally affixed to one of said arm members on the longitudinally extending holding arm member;

(c) timing and coordinating means connected to said moving means to time and coordinate the relative movement of said pair of holding arms from said first and second diametrically opposing horizontal positions into alignment in said vertical position and then into alignment in said first horizontal position whereby said arms hold said wrapping material between them in said vertical and said first horizontal positions and cut said wrapping material in said vertical position.

4,216,641
CROP HARVESTING MACHINE
Earl E. Koch, Mohnton, and Philip J. Ehrhart, Rothsville, both of Pa., assignors to Sperry Corporation, New Holland, Pa.
Filed Jun. 13, 1979, Ser. No. 48,286
Int. Cl.[3] A01D *43/10*
U.S. Cl. 56—14.4 **16 Claims**



1. In a crop harvesting machine having a mobile frame adapted for movement across a field; a crop harvesting header having a forward end transverse to the line of travel of said crop harvesting machine, a right side, a left side laterally spaced from said right side, and a rear discharge area; a crop cutting means transversely disposed at said forward end of said header for engaging and severing the crop to be harvested, said crop cutting means including right and left sickle bars, each said sickle bar having an inboard end and a remote outboard end, each said sickle bar being positioned such that the respective said outboard ends are adjacent the respective sides of said header; a sickle bar drive means for providing reciprocating motion to said crop cutting means, said sickle bar drive means being operably connected to the outboard end of each respective said sickle bar; a rotatable crop treating means for conditioning said severed crop, said crop treating means being located rearward of said rear discharge area substantially parallel to said crop cutting means; and a primary drive means for providing operational movement of said crop treating means and said sickle bar drive means, the improvement wherein said sickle bar drive means comprises:

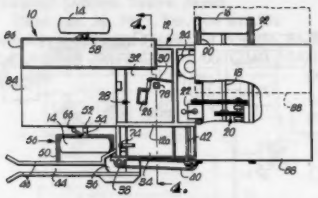
right and left wobble drive units for transforming rotary motion into reciprocating linear motion for the respective said sickle bars, each said wobble drive unit being connected to the outboard end of said sickle bars; and

right and left rotary input shafts interconnecting said crop treating means and the respective said wobble drive units, each respective said rotary input shaft being rotatable with said crop treating means for transferring rotational motion to the respective said wobble drive unit.

4,216,642
TOBACCO-HARVESTING METHOD AND APPARATUS

Donald E. Spratt, Spring & Summer Sts., Weston, Mo. 64098, and Franklin D. Spratt, Lake Jackson, Tex., assignors to Donald E. Spratt, Weston, Mo.

Filed Sep. 28, 1978, Ser. No. 946,820
Int. Cl.[2] A01D 45/16
U.S. Cl. 56—27.5 9 Claims



1. Apparatus for use in harvesting tobacco plants comprising:

a chassis;

ground-engaging means supporting the chassis for movement along a row of the plants to be harvested;

means for effecting said movement of the chassis;

a plant cutter supported by said chassis in disposition for severing plants from the ground during said movement of the chassis;

an operator's station on the chassis so disposed that an operator located at said station may take manual control of the plants upon said severance by said cutter;

a stake carried by said chassis in an upright disposition closely adjacent said operator's station for accumulating severed plants successively impaled on the stake by the operator;

a pair of decks carried by the chassis on opposite fore-and-aft sides of said stake and said station,

one of said decks being disposed to underlie and support the accumulation of plants on the stake to prevent damage to the plants while the stake is being loaded,

said stake being removably mounted in said upright disposition for periodic replacement when the stake is loaded with plants; and

means carried by said chassis closely adjacent said station for storing a supply of replacement stakes,

the other of said decks being disposed for supporting loaded stakes that have been removed from said upright disposition and deposited on said other deck,

said cutter, said decks, said stake, and said storing means all being so located with respect to said station that the operator may carry out the functions of taking the severed plants from the cutter, impaling them on the stakes, depositing loaded stakes on said other deck, and replacing the loaded stakes with new stakes without leaving said station.

4,216,643
GUARD MEANS FOR ROTARY MOWERS

James P. Malone, 1 Odell Ct., Syosset, N.Y. 11791

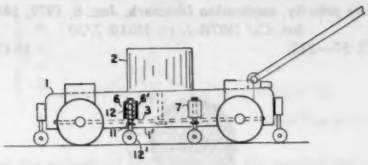
Continuation of Ser. No. 827,847, Aug. 26, 1977, abandoned.
This application Mar. 12, 1979, Ser. No. 19,715
Int. Cl.[2] A01D 75/20
U.S. Cl. 56—320.1 1 Claim

1. In a rotary power mower of the type having a hollow base member, a horizontal blade rotatably mounted in the base member, the base member being adjustably elevated off the ground by a plurality of adjustable wheels;

means to prevent a person's foot from extending under the base member into contact with said blade, comprising guard means mounted on and around the entire periphery of said base member, said guard means extending into close proximity to the ground, comprising:

a plurality of vertically extending members connected to the base,

a plurality of ground contacting wheels one connected to each vertically extending member,

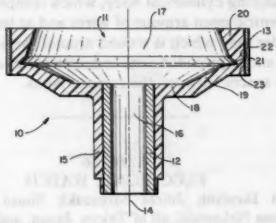


and means connected to the vertically extending members to spring load the ground contacting wheels into contact with the ground as the mower is moved.

4,216,644
OPEN END SPINNING ROTOR

Richard V. Wright, and Robert E. Carter, both of Sanford, N.C., assignors to Rogers Corporation, Rogers, Conn.

Filed Nov. 7, 1978, Ser. No. 958,537
Int. Cl.[2] D01H 1/12
U.S. Cl. 57—58.89 5 Claims



1. A spinning rotor for use in an open end spinning device, the spinning rotor having a longitudinal axis about which it is rotated during use, the spinning rotor comprising:

a body, said body being comprised of a plastic material and including:

a first portion which defines receiving bowl, said bowl having an open first end which lies in a first plane transverse the longitudinal axis of the rotor, first ends of said body and first portion defining said first plane, said bowl being symmetrical with respect to the said rotor longitudinal axis, said body first portion having a cylindrical outer wall section which is coaxial with said rotor longitudinal axis, said cylindrical outer wall section extending from said first plane; and

a second portion integral with said first portion, said second portion extending from the second end of said first portion and being symmetrical with respect to said rotor longitudinal axis, said second portion defining a cylindrical passage which extends between the second end of said bowl and the second end of said body, said passage being coaxial with the rotor longitudinal axis and having a diameter less than the diameter of said bowl first end;

a metal bushing positioned in said body second portion passage; and

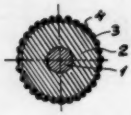
a metal rim circumscribing at least a portion of said body means first portion cylindrical outer wall section for reducing deformation of said rotor when the rotor is subjected to centrifical forces.

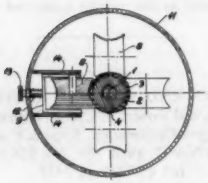
4,216,645

WOUND CABLE AND APPARATUS FOR FORMING CABLES

Axel Andersen, Gentofte, Denmark, assignor to Aktieselskabet Nordiske Kabel-OG Traadfabriker, Copenhagen, Denmark

Filed May 31, 1978, Ser. No. 911,023
Claims priority, application Denmark, Jun. 6, 1977, 2491/77
Int. Cl.[3] D07B 1/16; H01B 7/20
U.S. Cl. 57—212 19 Claims





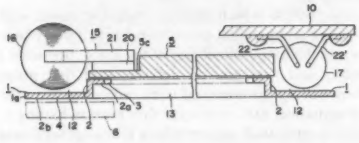
2. An oblong cylindrical body, which comprises a longitudinal concentric open armour of wires and at least one superjacent binder tape which is wound around the wires in an open winding and is provided with indentations in at least some of the open spaces between the armour wires.

4,216,646

ELECTRONIC WATCH

Masataka Ikenishi; Joichi Miyazaki; Shozo Kushida, and Hiromasa Nakanishi, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,560
Claims priority, application Japan, May 20, 1977, 52-058381
Int. Cl.[2] G04C 3/00; G04B 19/24
U.S. Cl. 368—28 7 Claims



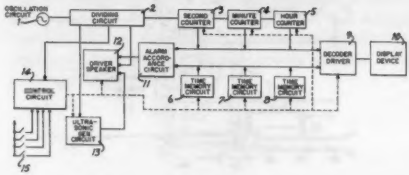
1. In an electronic watch having components including an oscillator circuit package for developing an oscillating time standard signal, an electric motor, an electronic circuit package for receiving the time standard signal and for developing signals to drive the electric motor, a battery for powering the oscillator circuit package, the electric motor and the electronic circuit package, and a calendar mechanism driven by the electric motor; the improvement comprising: said calendar mechanism including a date ring having a stepped cross section dimensioned to define a space peripheral of said date ring, said date ring being positioned with the peripheral space defined by said stepped portion facing the watch components; and at least one of the watch components being disposed within the peripheral space defined by said stepped portion and oriented to minimize the combined thickness of said date ring and the watch components.

4,216,647

ELECTRONIC TIMEPIECE

Ichiro Hattori, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,744
Claims priority, application Japan, Nov. 18, 1977, 52-138729
Int. Cl.[2] G04C 3/00, 21/00; G04B 37/12
U.S. Cl. 368—245 3 Claims



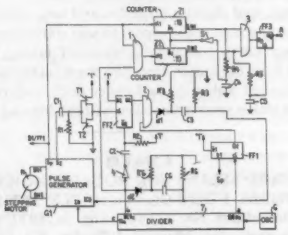
1. In an electronic alarm timepiece having an oscillator circuit for generating a high frequency output suitable as a time standard; a dividing circuit connected to the oscillator circuit for dividing the output thereof; a time counter receptive of the output of the dividing circuit for counting time; a settable time memory circuit and an alarm accordance circuit for detecting a coincidence between the count in the time counter and the time in the memory circuit; the improvement comprising an electro-mechanical acoustic transducer having at least two mechanical resonant frequencies wherein one is in the audible range and one is in the ultrasonic range; and alarm generating means for effecting the production of an alarm sound in the audible range in response to the detection of a coincidence by the alarm accordance circuit and for selectively effecting the production of an alarm in the ultrasonic range for controlling devices external of the timepiece.

4,216,648

SYSTEM FOR DETECTING THE END USEFUL LIFE OF A BATTERY IN AN ELECTRONIC TIME-PIECE

Bernard Maire, Marin, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed Dec. 21, 1978, Ser. No. 971,811
Claims priority, application Switzerland, Dec. 28, 1977, 16121/77
Int. Cl.[2] G04C 3/00; G08B 21/00
U.S. Cl. 368—66 6 Claims



1. A system for detecting the end of useful life of a battery in an electronic time-piece in which driving pulses are applied to a stepping motor having a coil, said driving pulses having a duration depending on the intensity of the current in the motor coil such that the pulse duration increases as the voltage supplied by the battery to the coil decreases, said system comprising:

means for producing image pulses with the same duration as that of said driving pulses; and

detecting means responsive to said image pulses having a

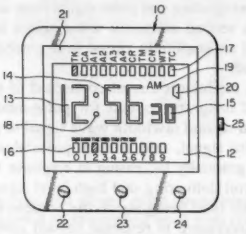
duration higher than a predetermined value for producing a signal indicating the end of useful life of the battery.

4,216,649

FUNCTION SELECTION CIRCUIT FOR MULTI-FUNCTION TIMEPIECE

Singo Ichikawa, Sayama; Fujio Ishida, Kodaira, and Hideyuki Kawashima, Higashikurume, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,501
Claims priority, application Japan, Jul. 6, 1976, 51/80154
Int. Cl.[2] G04B *19/24*; G04F *8/00*; G04B *27/00*
U.S. Cl. 368—109 **11 Claims**



1. A multi-function electronic timepiece having a standard frequency oscillator, a frequency divider coupled to said standard frequency oscillator, a timekeeping circuit coupled to an output of said frequency divider for providing time information signals, and display means responsive to said time information signals for displaying time information, comprising:

an externally actuated function switch;

function selection circuit means coupled to said function switch and responsive to successive actuations thereof for producing function selection signals in a predetermined sequence from a plurality of output terminals of said function selection circuit means; and

function circuit means responsive to each of said function selection signals for controlling said electronic timepiece to operate in a corresponding one of a plurality of function modes including at least a timekeeping mode, a chronograph mode and a time correction mode;

wherein, when said function switch is actuated while the electronic timepiece is in said timekeeping mode, said function selection circuit means is responsive to a plurality of subsequent actuations of said function switch for producing function selection signals designating at least one function mode other than said time correction mode before a function selection signal designating said time correction mode is produced by said function selection circuit means in said predetermined sequence.

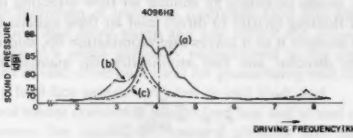
4,216,650

ALARM WRISTWATCH

Yoshiaki Hara; Shigeo Mori; Fumikazu Murakami; Ichiro Horikoshi, and Soya Takahasai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 831,276, Sep. 7, 1977, abandoned. This application Mar. 20, 1979, Ser. No. 22,144
Claims priority, application Japan, Sep. 7, 1976, 51-120367
Int. Cl.[2] G04B *23/12*
U.S. Cl. 368—72 **3 Claims**

1. An alarm wristwatch comprising a watchcase having a back with an inclined peripheral portion, a watchband attached to said watchcase at opposite sides thereof, a watch movement in a forward portion of said watchcase with a cavity in a rearward portion of said watchcase between said watch movement and said back, a transducer facing into said cavity and driven at a selected frequency to generate an alarm sound, said watchcase having a plurality of sound holes in said inclined peripheral portion opening from said cavity to the atmosphere, said sound holes being located solely within an angle of 45° on either side of the longitudinal center line of said watchband to avoid blocking of any of said holes by the arm of a



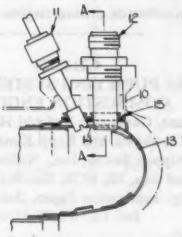
wearer, the volume of said cavity and the number and size of said sound holes being selected to constitute a Helmholz resonator responsive to the frequency of said transducer to increase the sound pressure generated by said transducer and efficiently transmit the sound to the atmosphere.

4,216,651

SEALING ARRANGEMENT FOR USE IN A COMBUSTION ASSEMBLY

Alan Ormerod, Oswaldtwistle, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 9, 1978, Ser. No. 904,288
Claims priority, application United Kingdom, May 11, 1977, 19705/77
Int. Cl.[2] F02C *7/28*
U.S. Cl. 60—740 **12 Claims**



1. A sealing arrangement for use in a combustion assembly, comprising a first member having therein a first aperture which is arranged to accommodate a fuel spray device with clearance and a second aperture which is arranged to accommodate an igniter such that said first member is located by the igniter in use, and a second member having therein a first aperture which is arranged to accommodate the fuel spray device such that said second member is located by the fuel spray device in use and a second aperture which is arranged to accommodate the igniter with clearance, said first and second members being relatively movable.

4,216,652

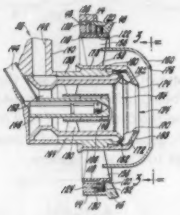
INTEGRATED, REPLACEABLE COMBUSTOR SWIRLER AND FUEL INJECTOR

Avrum S. Herman; Samuel B. Reider, both of Indianapolis, and Cecil H. Sharpe, Brownsburg, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 8, 1978, Ser. No. 913,818
Int. Cl.[2] B05B *7/10*
U.S. Cl. 60—748 **2 Claims**

1. An air blast fuel supply system for directing air and fuel into a combustor having a fixed dome thereon comprising: a floating swirler and fuel injector nozzle, means for radially supporting both said swirler and fuel injector nozzle for free radial movement and axial restraint with respect to said dome,

means for defining a tangential fuel director movably supported for axial movement on said fuel injector nozzle, a fuel atomization lip fixed on said floating swirler and located in spaced overlying relationship to said tangential fuel director to form an annular fuel film at the outlet of said fuel injector nozzle, means including an annular air flow directing lip fixed on said floating swirler to direct inlet air flow against the fuel film to atomize it as it leaves said atomization lip, said tangential fuel director and fuel atomization lip maintaining said



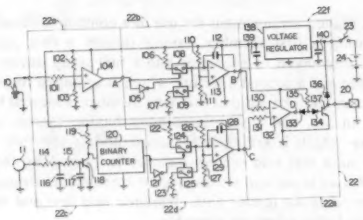
annular fuel film throughout axially shifted positions of said tangential fuel director with respect to said fuel atomization lip, said fuel atomization lip having an outlet edge thereon and said outer air flow directing lip having an outlet edge thereon maintained at a constantly fixed dimensional relationship therebetween throughout axial shifted movements of said tangential fuel director whereby the fuel break-up point for atomization of fuel and air from said fuel nozzle remains the same with respect to the combustor during engine operation.

4,216,653

EXHAUST GAS PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takamichi Nakase, Gamagori; Tadashi Hattori, Okazaki; Junichiro Naito, Toyokawa, and Kenji Kondo, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jan. 10, 1978, Ser. No. 868,313
Claims priority, application Japan, Jan. 28, 1977, 52-8892
Int. Cl.² F01N *3/10*
U.S. Cl. 60—276 **4 Claims**



1. A secondary-air control system for an internal combustion engine wherein secondary-air is intermittently supplied to the exhaust system of the engine upstream of a three-way catalyst containing an oxygen storage material so that the exhaust air-fuel ratio swings, on both rich and lean sides of a stoichiometric ratio alternately, said secondary-air control system comprising:

an air-fuel ratio sensor located downstream of said three-way catalyst for detecting the oxygen content of the exhaust gases supplied with secondary air to generate a signal indicative of the air-fuel ratio of the exhaust gases;

an engine speed sensor for generating an engine speed signal indicative of a delay time of the engine operation;

an electronic control unit responsive to said air-fuel ratio signal and said engine speed signal, for generating a control pulse signal, said electronic control unit including:

a comparison circuit, connected to said air-fuel ratio sensor, for comparing said air-fuel ratio signal with a preset value and for generating a high or a low level signal depending on whether said air-fuel ratio signal is above or below said preset value;

a first integrator circuit connected to said comparison circuit for integrating said high or low level signals to produce a first sawtooth wave signal;

a converter circuit connected to said engine speed sensor for generating a pulse signal having a frequency corresponding to engine speed;

a secondary integrating circuit connected to said converter circuit for integrating said pulse signal from said converter circuit to a second sawtooth wave signal having a frequency and an amplitude varied in accordance with the engine speed;

a pulse width modulator circuit connected to said first and said second integrator circuit for pulse-modulating said first and said second sawtooth wave signal to produce said control pulse signal, said control pulse signal having a duty cycle gradually increasing in response to said comparator circuit delivering said high level signal indicative of the air-fuel ratio being above the predetermined value, gradually decreasing in response to said comparator circuit delivering said low level signal indicative of the air-fuel ratio being below the predetermined value; and

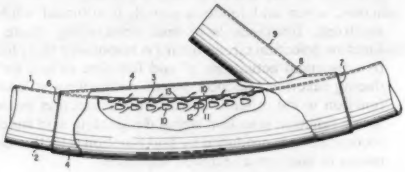
control valve means including an electromagnetic valve connected to receive said control pulse signal and associated with a secondary air supply system, said control valve means being actuated by said control pulse signal to intermittently supply the secondary air in accordance with said control pulse signal having a varying duty cycle.

4,216,654

FUEL COMPONENT EXTRACTOR

Donald C. Pletts, 145 Ocean Ave., #502, Palm Beach Shores, Fla. 33404

Filed Aug. 22, 1978, Ser. No. 935,849
Int. Cl.² F02M *25/06*
U.S. Cl. 60—311 **3 Claims**



1. An extractor for fuel components of an exhaust stream comprising:

(a) a curved duct for exhaust gases, said duct defining

(b) a curvate longitudinal interior flow path therethrough to impart a transverse inertial force on exhaust gases flowing longitudinally through said curvate flow path,

(c) a chamber exterior of said curvate flow path,

(d) transfer means for transferring fuel components from the inner arcuate portion of said curvate flow path to said chamber,

(e) said transfer means including a plurality of apertures in said duct along the inner arcuate portion of said curvate flow path and

(f) a deflector adjacent each aperture and extended into the inner arcuate portion of said curvate flow path, said deflectors being formed integrally with a wall of said duct and deformed therefrom to form said apertures.

4,216,655
WAVE-OPERATED POWER PLANT

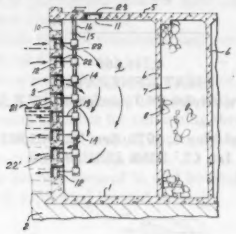
Hendrik Ghesquiere, 144 Lasalle St., Baie Comeau, Canada G4Z 1S1

Filed Mar. 15, 1979, Ser. No. 20,787

Claims priority, application United Kingdom, Mar. 17, 1978, 10594/78

Int. Cl.[2] **E02B** *9/08;* **F03B** *13/12*

U.S. Cl. 60—398 **3 Claims**



1. A wave-operated power plant comprising a caisson type breakwater having an upstanding main wall erected to face the predominant wave direction and extending from below the low water level of an open water body to above the maximum height of the waves from which it is desired to extract energy, said caisson forming a substantially-closed chamber with said wall, said wall having a plurality of perforations substantially uniformly distributed throughout said wall and establishing communication between the open water body and said chamber, first propellers mounted in a first set of said perforations and driven by the waves rushing from the open water body through the perforations of said first set, water flowing into said chamber past said first propellers further spending its energy by causing a rise in the water level in said chamber, second propellers mounted in a second set of said perforations and driven by the water stored in said chamber and rushing back to said open water body, and power generating means coupled to said propellers.

4,216,656
HIGH-EFFICIENCY HYDROSTATIC VEHICULAR DRIVE SYSTEM

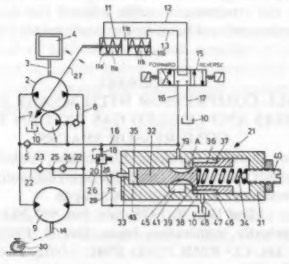
Karlmann Hamma, Tettnang, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 50,959

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1978, 2827810

Int. Cl.[2] **F16H** *39/46*

U.S. Cl. 60—445 **10 Claims**



1. A drive system comprising:

an engine;

a hydraulic variable-displacement drive pump coupled to and driven by said engine and having a control element displaceable from a null position corresponding generally to zero pump displacement into an end position corresponding generally to maximum pump displacement;

a hydraulic motor operating against a load;

means including at least one hydraulic feed line interconnecting said drive pump and said motor for driving said motor at a speed generally proportional to the displacement of said drive pump and for pressurizing said feed line at a feed-line pressure related to said load; and

control means connected to said feed line and to said control element for urging said control element into said end position with a relatively large force when said feed-line pressure lies above and below a predetermined range, and for urging said control element into said end position with a relatively small force when said feed-line pressure lies within said range.

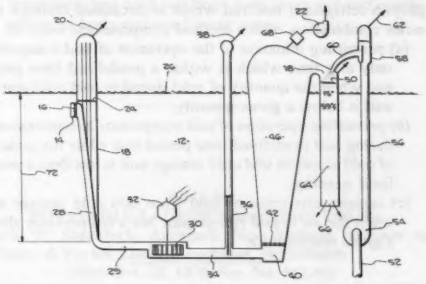
4,216,657
MIST FLOW OCEAN THERMAL ENERGY PROCESS

Stuart L. Ridgway, Santa Monica, Calif., assignor to R & D Associates, Marina del Rey, Calif.

Filed Mar. 20, 1978, Ser. No. 888,018

Int. Cl.[2] **F03G** *7/04*

U.S. Cl. 60—641 **18 Claims**



1. An apparatus for recovering energy from warm and cold ocean waters comprising:

a floating structure extending from above the surface of the ocean to a significant depth;

intake and filtering means for receiving warm water from near the surface of the ocean;

deaeration means for removing some of the gases from said intake water;

downwardly extending penstock or water guiding means for said warm surface water;

energy extraction or turbine means coupled to receive said warm water from said guiding means;

further deaeration means for removing additional gases from the water after it exits the turbine;

means for raising the warm water from said turbine to substantially its original level, including mist generation means located substantially at the level of said energy extraction turbine means for forming said water into a mist, means extending from said mist generation means toward the top of the structure for guiding said mist, and vaccum pumping means for reducing the atmospheric pressure in the mist guiding means;

condensing means for returning said mist and vapor to the liquid form;

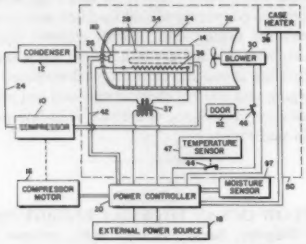
cold water intake and pumping means for supplying cold water from a deeper level of the ocean to said condensing means; and

means for discharging the resultant intermediate temperature liquid into the ocean.

4,216,658
REFRIGERATION MEANS AND METHODS

Ralph N. Baker, III, 18 Callecita, South Laguna, Calif. 92675; James D. Bond, 1724 Port Sheffield, Newport Beach, Calif. 92660, and Byron W. Olson, 435 Via Lido Soud, Newport Beach, Calif. 92663

Filed May 11, 1978, Ser. No. 904,937
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—99 **12 Claims**



1. The method of operating a refrigeration apparatus which employs the series combination of a compressor, a condenser, an evaporator and a cold storage unit and which further employs a refrigerant material which is circulated through that series combination, which method comprises the steps of:

(a) permitting initiation of the operation of said compressor only at a time which is within a predefined time period and when the quantity of cold stored in said cold storage unit is below a given quantity;

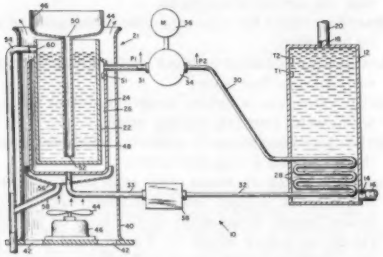
(b) permitting operation of said compressor to continue only during said predefined time period and while the quantity of cold stored in said cold storage unit is less than a predefined quantity;

(c) causing extraction of cold from said cold storage unit when the air in said refrigerator has a temperature above a given temperature.

4,216,659
THERMAL SYSTEM

Roger F. French, P.O. Box 158, Jackson, N.H. 03846

Filed Jan. 15, 1979, Ser. No. 3,631
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—186 **12 Claims**



1. Thermal system for hot water heating comprising:

(a) a hot water storage tank having an inlet opening for receiving cold water and an outlet opening for the exit of heated water,

(b) a heat exchange unit comprising a storage tank for receiving warm waste water and discharging cooled waste water,

(c) an evaporator vessel comprising a hollow jacket surrounding the waste water storage tank,

(d) a condensing coil located within the hot water storage tank and connected to the evaporator vessel in a closed loop system,

(e) a refrigerant fluid contained within the evaporator vessel and condensing coil,

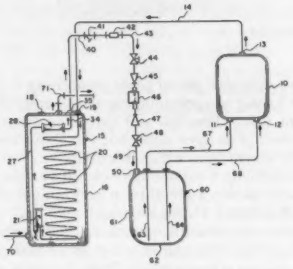
(f) means for passing air to be dehumidified across the evaporator vessel, and

(g) means for circulating the refrigerant fluid within the closed loop system, so that the fluid enters one end of the evaporator vessel as a liquid and exits as a vapor, and enters the condensing coil as a vapor and exits therefrom as a liquid.

4,216,660
HEAT GENERATOR

Steven S. Rodgers, Avalon, N.J., assignor to T.E.S., Inc., Atlantic City, N.J.

Filed May 4, 1978, Ser. No. 902,982
Int. Cl.³ F25B *27/02, 43/00*
U.S. Cl. 62—238 **20 Claims**



1. An apparatus for generating heat comprising:

(a) a compressor having an inlet and an outlet,

(b) a prime mover means operably coupled to drive the compressor,

(c) a conduit means connected to the compressor inlet and to the compressor outlet,

(d) a heat exchange fluid charged in the apparatus at a pressure in the range of 10 to 100 psig at 70° F.,

(e) a heat exchanger means capable of transferring heat from the heat exchange fluid to a second fluid for use outside the apparatus,

(f) a flow restricting means to restrict the volume of heat exchange fluid reaching the compressor, and

(g) a fluid expansion means to cause the expansion of the heat exchange fluid to be entirely in a gaseous state controlled such that no significant heat transfer is made from ambient conditions

(h) wherein the conduit means interconnects elements (a), (c), (f) and (g) in series to carry the heat exchange fluid from the compressor outlet around the system through each element and back to the compressor inlet.

4,216,661
SCROLL COMPRESSOR WITH MEANS FOR END PLATE BIAS AND COOLED GAS RETURN TO SEALED COMPRESSOR SPACES

Kenji Tojo, Ibaraki; Hirokatu Kousokabe, Yokohama; Nobukatsu Arai, Ushikumachi, and Eiji Sato, Shimoinayoshi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 8, 1978, Ser. No. 967,893
Claims priority, application Japan, Dec. 9, 1977, 52/147096
Int. Cl.² F25B *31/00;* **F04C** *17/02, 29/00*
U.S. Cl. 62—505 **7 Claims**

2. A gas pressure increasing system having at least a scroll compressor, an exhaust conduit and a gas cooler, said scroll compressor comprising:

a fixed scroll member including an end plate, a wrap at-

tached to one surface of said end plate in an upstanding position and primarily formed in an involute curve, an exhaust port formed in said end plate in a position close to a commencing end of said wrap, and a suction port formed in said end plate in a position close to a terminating end of said wrap;

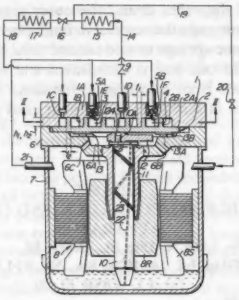
an orbiting scroll member including an end plate, and a wrap attached to one surface of said end plate in an upstanding position and primarily formed in an involute curve, said orbiting scroll member and said fixed scroll member being arranged in juxtaposed relation with the wraps thereof being fitted close together;

means for inhibiting the rotation of said orbiting scroll member on its own axis;

a housing means attached to said surface of said end plate of said fixed scroll member which has said wrap and including a housing chamber for containing therein said orbiting scroll member, said housing means being formed with at least two communicating ducts;

at least one bearing secured to said housing means;

a drive shaft supported by said bearing;



a balancing weight;

a pin attached to said drive shaft in a position remote from the center axis of said drive shaft for transmitting the rotation of said drive shaft from said position to said orbiting scroll member as an orbiting motion; and

a motor connected to said drive shaft;

wherein the improvement comprises:

a branch conduit branching, at one end thereof, off a gas path from a point therein immediately posterior to the gas cooler and mounting a pressure reducing means midway thereof for reducing the pressure of a compressed gas to an intermediate pressure level and expanding the same so as to cause the compressed gas of an intermediate pressure level to act on a surface opposite to the surface provided with said wrap of said end plate of said revolving scroll member of said scroll compressor; and

means for returning the compressed gas acting on said opposite surface of said orbiting scroll member of said scroll compressor to sealed spaces of an intermediate pressure level defined between said fixed scroll member and said orbiting scroll member.

4,216,662

CUSHION STITCH CONSTRUCTION FOR MEN'S HOSIERY

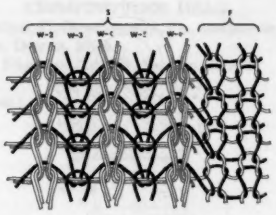
J. Nimrod Harris, Jr., and Willie M. Howell, both of Burlington, N.C., assignors to Pickett Hosiery Mills, Inc., Burlington, N.C.

Filed Mar. 3, 1978, Ser. No. 883,327
Int. Cl.[2] A41B *11/02*; D04B *9/46*
U.S. Cl. 66—186 **8 Claims**

1. A knitted seamless men's hose having leg, heel, toe, upper foot and sole portions with at least said sole portion being constructed as to include a cushion knit stitch comprising:

(a) a first set of courses being formed of stitch loops of a combination of a body yarn made from a first type of fiber and a reinforcement yarn made from a second type of fiber;

(b) a set of intervening courses being formed of stitch loops of said body yarn alone;



(c) a set of alternating wales formed of plain stitch loops formed of said body yarn alone separated by intervening stitches formed of a combination of said body yarn and said reinforcement yarn;

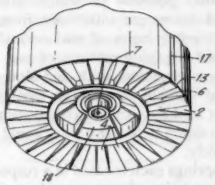
(d) a second set of alternating wales formed of tuck stitch loops including both said body yarn alone and said combination of body and reinforcing yarns.

4,216,663

ROTATABLE LAUNDRY MACHINE DRUM

Frank W. Shacklock, Auckland, New Zealand, assignor to Fisher & Paykel Limited, Auckland, Netherlands

Filed Oct. 23, 1978, Ser. No. 953,402
Claims priority, application New Zealand, Oct. 25, 1977, 185505
Int. Cl.[2] D06F *39/00*
U.S. Cl. 68—3 R **5 Claims**



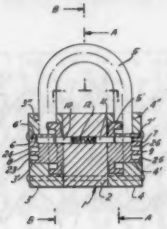
1. A rotatable drum for a laundry machine comprising a cylindrical member formed from rectangular shaped sheet material attached at the ends thereof, a radially inwardly directed flange integrally formed on at least one end of said cylindrical member and having a width substantially less than the length of the cylindrical member, said flange having a castellated shape at its inner edge by having triangular webs alternating with frusta segments, the alternate frustum segments lying on two different frusta diverging from the outer edge of said flange at the cylindrical surface of said cylindrical member with the apices of the triangular webs lying on a fold line common to said cylindrical surface and said frustum segments.

4,216,664

PADLOCK

Roma Slavinsky, 99-95, 63rd Dr., Apt. 11-U, Rego Park, N.Y. 11374

Filed Mar. 7, 1979, Ser. No. 18,462
Int. Cl.[2] E05B 67/22
U.S. Cl. 70—39 **6 Claims**



1. A padlock, comprising

a body having an axis, two axial end portions and a central portion therebetween, each of said end portions having a first circular hole extending in an axial direction and a second hole extending in a direction which is transverse to said axial direction, said central portion having a plurality of through-going third holes which extend between and are open into said first holes;

a shackle member having two end sections and movable between a first transverse position in which said end sections are inserted into said second holes of said body, and a second transverse position in which said end sections are withdrawn from said second holes of said body, each of said end sections of said shackle member having a slot;

two drums each having an engaging section and a plurality of further through-going holes whose number and location correspond to those of said through-going holes of said central portion of said body, each of said drums being inserted in a respective one of said first holes and rotatable about said axis between a first circumferential position in which said through-going holes of said drums are in alignment with said through-going holes of said central portion of said body and said engaging section of said drums engage said slots of said end sections of said shackle member when the latter is in its first transverse position so as to lock said shackle member in said body, and a second circumferential position in which said through-going holes of said drums are withdrawn from alignment with said through-going holes of said central portion of said body and said engaging sections of said drums are withdrawn from engagement with said slots of said end sections of said shackle member so that the latter can be moved from said first transverse position to said second transverse position to thereby unlock said shackle member from said body;

a plurality of springs each located in a respective one of said through-going holes of said central portion of said body and acting in two opposite axial directions;

a plurality of pairs of inner pins having an identical length, the pins of each pair of said inner pins being located at opposite axial sides of a respective one of said springs, said inner pins being movable between a first axial position in which they extend through both said through-going holes of said central portion of said body and the through-going holes of a respective one of said drums so that distal ends of said inner pins are axially outwardly offset relative to an interfaces between said central portion of said body and a respective one of said drums whereby said drums cannot rotate about said axis, and a second circumferential position in which said pins are withdrawn from said through-going holes of said drums into said through-going holes of said central portion of said body so that said distal ends of said inner pins coincide with the interfaces between said central portion of said body and a respective one of said drums whereby the latter can rotate between said first and second circumferential positions;

a first plurality of outer pins and a second plurality of outer pins, the outer pins of said first plurality being located in said through-going holes of one of said drums whereas the outer pins of said second plurality are located in said through-going holes of the other drum, at least two outer pins of each plurality having differing lengths, and at least one outer pin of said first plurality having a length differing from the length of at least one outer pin of said second plurality; and

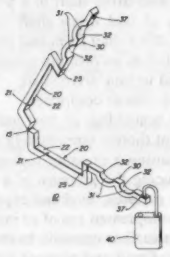
two keys a first of which has a first plurality of projections having lengths complementary to the lengths of said outer pins of said first plurality, whereas the second key has a second plurality of projections having lengths complementary to the lengths of the outer pins of said second plurality, so that when one of said keys is inserted into said through-going holes of one of said drums, the outer pins located in said one drum urge respective inner pins against the force of said springs to said second axial position, and when the other key is inserted into said through-going holes of the other drum, the outer pins located in said other drum urge the respective inner pins against the force of the same springs to said second axial position, whereas when said one key is withdrawn and said other key is withdrawn from said drums, the same springs urge the inner pins of said pairs to said first axial position.

4,216,665

PORTABLE SKI/POLE LOCK AND CARRYING APPARATUS

Kay McKelvey, 1419 N. 15th St., Boise, Id.

Filed Jul. 14, 1978, Ser. No. 924,503
Int. Cl.[2] E05B 73/00
U.S. Cl. 70—58 **2 Claims**



1. Portable apparatus for securing and carrying a pair of skis and poles comprising:

a first clamping means having opposing members operable to receive a pair of skis;

a first hinge means connecting each of said opposing members at one end thereof;

a second clamping means having opposing members operable to receive a pair of ski poles;

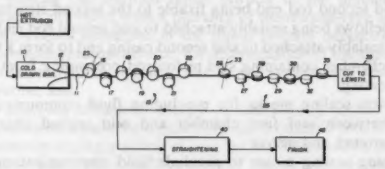
a second pair of hinge means, each of said second hinge means connecting one end of said opposing members of said second clamping means to one end of each of said opposing members of said first clamping means at an end opposite said first hinge means, each of said second pair of hinges transversely oriented to said first hinge means; and

locking means disposed on the apparatus for releasably holding said members in a closed position.

4,216,666
METHOD OF RELIEVING STRESS IN EXTRUDED SECTIONS

Hsiao Wu, Rockford, Mich., assignor to Extruded Metals, Belding, Mich.

Filed Sep. 18, 1978, Ser. No. 943,017
Int. Cl.³ B21C *19/00, 23/08, 1/20;* B21D *3/05*
U.S. Cl. 72—256 **1 Claim**



1. A method for continuously relieving stresses in hot extruded then cold drawn leaded yellow brass sections comprising the steps of:

(a) extruding hot brass through a first die to form an extruded section;

(b) cold drawing said extruded section through a second die into a finally configured section including localizing the residual tensile stresses to an area near the surface of said section as it is being cold drawn through said second die by limiting the percentage cross-sectional area reduction in said section to 18 percent or less as it is being cold drawn through said second die, and minimizing the residual stress at the center of said section and localizing the stress to an area near the surface of said section by providing a tapered bearing portion for said second die having an attack angle of between eight and twelve degrees;

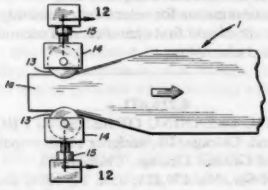
(c) mechanically bending said section relative to a horizontal longitudinal axis and relative to a vertical longitudinal axis including alternatively bending said section out of alignment by using a first mechanical bender having rollers set out of longitudinal alignment to flex said section beyond its elastic limit relative to a horizontal longitudinal axis and a second mechanical bender having rollers set out of longitudinal alignment to bend said section beyond its elastic limit relative to a vertical longitudinal axis; and

(d) straightening said section by passing it through a series of rollers of an in-line mechanical straightener.

4,216,667
METHOD OF FORMING A TAPER LEAF

Shoichi Otsuka, Hachioji, and Takashi Fukui, Chiba, both of Japan, assignors to Horikiri Spring Manufacturing Co., Ltd., Yachiyo, Japan

Filed Nov. 2, 1978, Ser. No. 957,026
Claims priority, application Japan, Dec. 23, 1977, 52-155280
Int. Cl.² B21B *1/42*
U.S. Cl. 72—366 **5 Claims**



1. A method of forming a taper leaf used in a composite laminated spring comprising:

cutting a sheet of spring material having a given thickness to a desired length;

pre-tapering a portion adjacent to one end of the sheet so that the width of the portion tapers towards the one end of the sheet, the given thickness of the portion being maintained during pre-tapering;

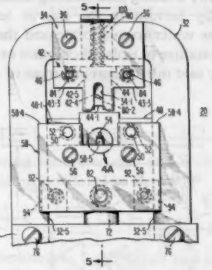
heating the pre-tapered portion prior to rolling; and

rolling the pre-tapered portion to taper the given thickness of the pre-tapered portion towards the one end of the sheet.

4,216,668
CRIMPING TOOL HEAD

Charles E. Walton, II, Downingtown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1979, Ser. No. 25,940
Int. Cl.³ B21D *37/12*
U.S. Cl. 72—412 **14 Claims**



1. A crimping tool head for use in a tool for crimping electrical socket contacts of the type characterized as including a tail section, said head adapted for crimping one of said contacts onto the end of a prestripped insulated wire conductor and simultaneously forming a probe hook from the tail section of said contact, said head comprising:

a frame;

tail crimping means, coupled to said frame, for guiding the formation of said probe hook;

upper crimping means, coupled to said tail crimping means, for guiding the formation of the section of said contact which is to be crimped on said wire conductor;

tail anvil means, slidably coupled to said frame opposing said tail crimping means and engagable against the opposed surface of said tail crimping means, for compressing said tail section against said tail crimping means whereby said tail section is formed into said probe hook; and

lower crimping means, slidably coupled to said frame opposing said upper crimping means and engagable with the opposed surface of said upper crimping means, for compressing the section of said contact which is to be crimped on said wire conductor against said upper crimping means.

4,216,669
CONTAMINANT ERROR REDUCTION SYSTEM FOR DEW POINT HYGROMETERS

John C. Harding, Jr., Watertown, Mass., assignor to General Eastern Instruments Corporation, Watertown, Mass.

Filed Oct. 6, 1978, Ser. No. 949,017
Int. Cl.² G01N *25/02*
U.S. Cl. 73—17 A **15 Claims**

1. A dew point hygrometer for determing the dew point of a gas sample, of the type having:

a mirror having a reflective surface exposed to the gas sample,

a light source for directing a beam of light upon the reflective surface of the mirror,

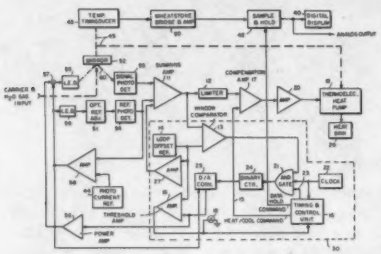
cooling and heating means in heat exchange relation with the mirror,

a photosensitive means responsive to light reflected from the surface of the mirror,

servo loop control means interposed between the photosensitive means output and the cooling means for maintaining the temperature of the mirror at the dew point of the gas sample,

wherein the improvement for reducing or eliminating dew point measurement error due to vapor pressure modification as induced by the presence of soluble contaminant on the reflective surface of the mirror comprises,

means for periodic interruption and disabling of the servo loop control means, for purposes of, and for causing said cooling means to cool said mirror to a temperature sufficiently below the dew point to cause coalescence of the condensate so as to form a film of water in order to totally dissolve the solute on the surface of said mirror and for subsequently causing said heating means to heat said mirror thereby permitting the mirror temperature to rise causing the water to evaporate and the solute to precipitate or crystallize in isolated colonies or aggregate clusters and to dry said mirror leaving areas of said mirror base of solute,



means for reflectance measurement from said mirror after total evaporation and redistribution of solute to establish the level of compensating signal to compensate for the reduction of said mirror reflectance by said precipitated solute, and

means for providing said compensating signal to the servo loop control means in such a manner as to provide for a predetermined constant density of condensate on the reflective surface after reverting back to normal operation, thereby causing undisturbed growth of condensate on bared regions between aggregates of soluble material so as to maintain mirror temperature control at the true dew point of the gas sample,

means for enabling said servo loop control, after said compensation signal has been provided, to control the temperature of said mirror at the dew point temperature,

means for temperature compensating said photosensitive means to provide a current component in its output which is constant with temperature change of the photosensitive means, said temperature compensating means making the dew density unaffected by temperature.

4,216,670

HYDRAULIC VIBRATION BRAKE PARTICULARLY FOR USE IN NUCLEAR POWER PLANTS

Jakob Zintel, Hüttenfeld, and Rudolf Zipser, Darmstadt, both of Fed. Rep. of Germany, assignors to Babcock-Brown Boveri Reaktor GmbH, Mannheim, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,545

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 2750737

Int. Cl.[2] G01M *3/26*

U.S. Cl. 73—46 **9 Claims**

1. A hydraulic brake for dampening motion between a first structure and a second structure comprising:

a casing having a first casing end and a second casing end; said first casing end being fixable to the first structure;

a piston slidably disposed within said casing between said first casing end and said second casing end to divide said casing into a first chamber and a second chamber;

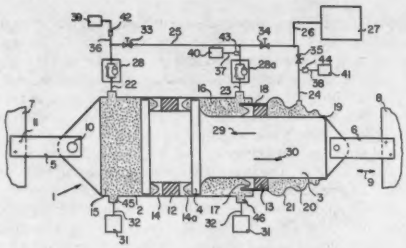
a piston rod having a first rod end and a second rod end, said first rod end being connected to said piston, said piston rod extending through said second chamber and further extending slidably through said second casing end;

said second rod end being fixable to the second structure;

a bellows being sealably attached to said second rod end and sealably attached to said second casing end to form a third chamber containing said piston rod protruding from said casing;

piston sealing means for precluding fluid communication between said first chamber and said second chamber around said piston;

casing sealing means to preclude fluid communication between said second chamber and said third chamber around said piston rod;



a hydraulic fluid reservoir;

said first chamber, said second chamber, said third chamber, and said reservoir being filled with hydraulic fluid at a common pressure;

conduit means for providing fluid communication between said first chamber, said second chamber, said third chamber and said reservoir;

isolation valve means for selectively isolating said first chamber, said second chamber and said third chamber from said reservoir and from each other;

throttling valve means for throttling the rate of fluid flow through said conduit means;

pressure means for selectively supplying pressure to said first chamber and said second chamber; and,

pressure detection means for selectively detecting and indicating pressure of said first chamber, said second chamber and said third chamber.

4,216,671

AUTOMATIC CLEANING OF SENSING PROBES

Jerome J. Kurland, Chicago, Ill., assignor to Metropolitan Sanitary District of Greater Chicago, Chicago, Ill.

Continuation of Ser. No. 479,351, Jun. 14, 1974, abandoned. This application Dec. 11, 1975, Ser. No. 639,657

Int. Cl.[2] B08B *7/02, 7/04;* **G01N** *33/18*

U.S. Cl. 73—61 R **2 Claims**

1. In a fully automated monitoring system of the qualitative conditions of liquids in a body of water subject to environmental changes, which includes the telemetric transmission of the analytic results from a plurality of remotely distributed un-

manned treating and field stations to a central data-collecting station with data acquisition apparatus, the method of enhancing the reliability of the analysed and transmitted test results which comprises

(a) continuously withdrawing a sample portion of the body of water and continuously centrifuging the sample portion in a closed vessel under pressure to separate the liquid portion from the particulate matter in the water, which separates from the latter and discharges from said vessel,

(b) passing the clarified liquid portion to the unmanned station provided with a plurality of membrane-type sensing probes immersed in the liquid portion deposited in container means therefor, for determination of the specific characteristic being analyzed by the appurtenant sensing probe, and

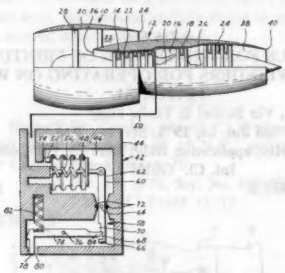
(c) applying ultrasonic energy to said sensing probes and container means for a period of approximately five to ten minutes during a period of one day to maintain the sensing probes in clean condition without human intervention.

4,216,672

APPARATUS FOR DETECTING AND INDICATING THE OCCURRENCE OF A GAS TURBINE ENGINE COMPRESSOR STALL

George R. Henry, Loveland, and William R. Spencer, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jan. 29, 1979, Ser. No. 7,118
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—115 **9 Claims**



1. In a gas turbine engine including a compressor, an apparatus for detecting and indicating the occurrence of a stall comprising:

a housing having an internal pressure chamber;

a discrete expansible chamber disposed within the internal pressure chamber;

means for pressurizing the internal pressure chamber and the interior of the expansible chamber in proportion to a selected engine pressure;

means responsive to changes in the selected engine pressure for establishing a pressure differential between the interior and the exterior of the expansible chamber; and

indicator means responsive to said pressure differential for indicating the occurrence of a sudden decrease in the selected engine pressure which exceeds a threshold value.

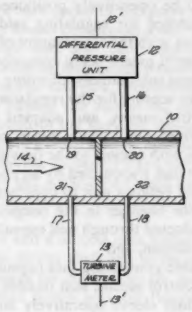
4,216,673

FLUID PROPERTY DETECTION SYSTEM

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 7, 1979, Ser. No. 10,058
Int. Cl.³ G01F *1/76*
U.S. Cl. 73—861 **9 Claims**

1. Fluid detection apparatus comprising: a pipe section; an orifice plate fixed in said pipe section; first means connected through said pipe section on opposite sides of said orifice plate to produce an output Δp proportional to the difference between the pressures on opposite sides of said orifice plate; a turbine meter having connections through said pipe section on opposite sides of said orifice plate, said turbine meter producing pulses at a frequency f_1 proportional to the volume flow



rate of a fluid flowing therethrough; and second means for producing an output proportional to the ratio

$$\Delta p/f_1^n$$

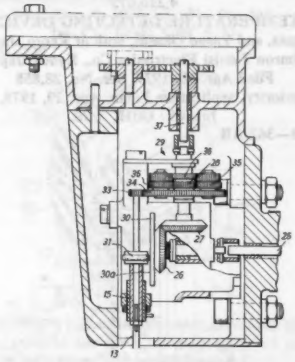
where n is one of the integers 1 and 2, and said ratio is proportional to a property of said fluid in said pipe section.

4,216,674

LIQUID FLOW METER

Alan G. Butcher, Wokingham, and Chan-Po Wong, Maidenhead, both of England, assignors to Dresser Europe, S.A., Brussels, Belgium

Continuation of Ser. No. 732,291, Oct. 14, 1976, abandoned. This application Feb. 3, 1978, Ser. No. 875,466
Claims priority, application United Kingdom, Oct. 15, 1975, 42363/75
Int. Cl.² G01F *1/90, 15/02*
U.S. Cl. 73—861.01 **2 Claims**



1. A temperature responsive fluid flow meter for determining the rate of fluid flow through a conduit, said meter comprising:

input shaft means to be positioned in the fluid conduit for rotating in response to the flow of fluid through the conduit;

flow rate indicator means for indicating the rate of fluid flow in the conduit;

differential means connected between said input shaft means and said indicator means for driving said indicator means in response to the rotation of said input shaft means;

adjustable calibration control means connected to said differential means for adjusting the drive ratio of said differential means; and

temperature control means connected to said calibration means to be operatively positioned in the flow of fluid being metered for regulating said calibration means in correlation with the temperature of the fluid, said temperature control means being comprised of:

capsule means substantially affording the entire temperature responsive sensing for the regulating input to said calibration control means, and adapted for immersion in the flowing fluid, said capsule means comprising a fluid tight enclosure with respect to the flowing fluid and containing a bellows unit surrounded by an enclosed volume of fluid fill for said bellows unit to contract and expand in accordance with changes in the temperature of the metered fluid conducted through said capsule means enclosure and fluid fill therein, and

a flexible cable connecting said capsule means and said calibration control means, said flexible cable having

a flexible outer sleeve operatively anchored at one end to said capsule means, and

a flexible inner cable through said outer sleeve operatively connecting at one end to said bellows unit and at the other end to said calibration control means;

said calibration control means being comprised of:

a disc on the end of said input shaft means,

a rotatable wheel radially contacting said disc, and

a rotatable shaft supporting said wheel and operatively connected to said flexible inner cable of said temperature control means and to said differential means; and

said differential means being comprised of:

an output shaft means connected to said indicator means for operating said indicator means,

first and second gears operatively connected to said output shaft and rotatable therewith;

first gear means on said input shaft means for transferring the motion of said input shaft to said first gear, and

second gear means on said rotatable shaft supporting said wheel for transferring the rotational motion of said shaft to said second gear.

4,216,675

TEMPERATURE DETECTING DEVICE

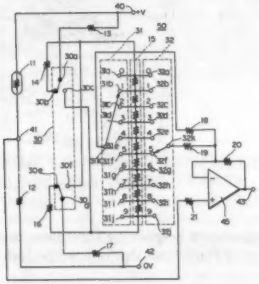
Kunio Nagata, and Yasuo Ohashi, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 10, 1979, Ser. No. 28,858

Claims priority, application Japan, Apr. 29, 1978, 53/51177

Int. Cl.³ G01K *7/18*

U.S. Cl. 73—362 AR **9 Claims**



1. In a temperature detecting device having an electrical bridge network means including a first and a second power terminal, a first and a second output terminal, a first arm having a temperature responsive resistance connected across said first power terminal and said first output terminal, a second arm having a reference resistance connected across said first output terminal and said second power terminal, a third arm connected across said first power terminal and said second output terminal, and a fourth arm connected across said second output terminal and said second power terminal, an improvement in said electrical bridge network means comprising:

a resistance potential divider having at least one intermediate terminal which represents said second output terminal, said intermediate terminal being connected with a means for selecting a dividing point along the resistance of said divider; and,

switching means connected across said first and second power terminals in series with said potential divider for inverting the connection of said potential divider in accordance with a temperature state of positive or negative about a temperature which is detected by said device;

said third and fourth arms including respective resistances which are selected by the selection of a dividing point by said selecting means.

4,216,676

APPARATUS FOR THE TESTING OF PRINTING OR LIKE CYLINDERS FOR OPERATING ON WEB MATERIAL

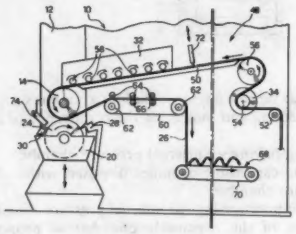
Aldo Bugnone, Via Bellini 2, Turin, Italy

Filed Jul. 14, 1978, Ser. No. 924,590

Claims priority, application Italy, Dec. 15, 1977, 69805 A/77

Int. Cl.² G01N *19/00*

U.S. Cl. 73—432 R **18 Claims**

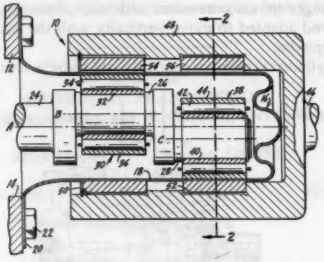


1. Apparatus for the testing of printing or like cylinders for operating on web material comprising a framework, support means carried by said framework, a testable subassembly removably supported by said support means, said subassembly comprising a carriage removably supported by said support means, a cylinder to be tested rotatably mounted on said carriage and tool means supported by said carriage and operatively associated with said cylinder for treatment of the web, a counter pressure roller mounted rotatably and interchangeably in said framework, conveyor means for conveying the web including a table over which a web is fed to the cylinder under test and discharge means for discharging the web after it has passed between said cylinder and said counter pressure roller, said conveyor means and said discharge means being disposed one above the other on the same side of said counter pressure roller.

4,216,677
HERMETICALLY SEALED ROTARY DRIVE APPARATUS

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jul. 17, 1978, Ser. No. 925,149
Int. Cl.[2] F16J 15/50
U.S. Cl. 74—17.8 9 Claims

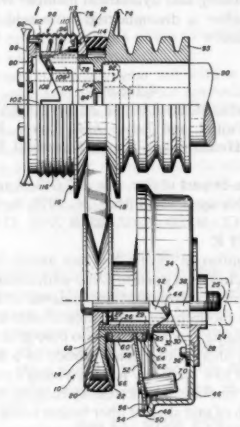


1. Rotary power drive apparatus comprising first and second shafts rotatable on a first axis, a non-rotatable flexible sealing member having first and second surfaces, first means supported by said first shaft for rotation on a second axis offset from said first axis, said first means being in rolling contact with said first surface along a band, and second means supported by said second shaft for rotation on a third axis offset from said first and second axes, said second surface being in rolling contact with said second means along a band.

4,216,678
DRIVE SYSTEM

Roger P. Butterfield, Candor; David C. Wade, and Gary A. Woollard, both of Ithaca, all of N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 17, 1978, Ser. No. 896,653
Int. Cl.[2] F16H 55/52
U.S. Cl. 474—12 4 Claims



1. Apparatus for transmitting drive between a drive shaft adapted to be connected to an engine and a driven shaft and especially for driving accessories driven by one of the shafts, the combination comprising:

a first variable pulley rotationally associated with the drive shaft and having an axially fixed flange connected to the drive shaft and a movable flange movable axially relative to the fixed flange and the drive shaft;

a torque cam and a cam follower connected respectively to the drive shaft and the movable flange for transmitting torque between the drive shaft and the movable flange;

speed responsive means for moving the movable flange axially away from the fixed flange above a first predetermined speed above zero speed of the drive shaft;

said speed responsive means comprising a disc spring biasing the movable flange and also centrifugally responsive means associated with the disc spring which is actuated by centrifugal force above said first predetermined speed of the drive shaft to change the bias of the spring and thus effect axial movement of the movable flange;

a second variable pulley rotationally associated with the driven shaft and having an axially fixed flange connected to the driven shaft and a movable flange movable axially relative to the second named fixed flange and the driven shaft;

a second torque cam and a second cam follower connected respectively to the driven shaft and to the second named pulley movable flange for controlling the axial movement of the second named pulley movable flange with respect to its fixed flange;

a spring between the second torque cam and its follower to provide an axially directed force urging the second pulley flanges toward one another;

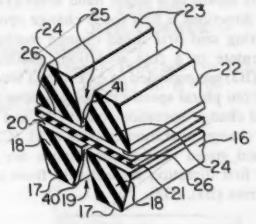
drive means between the variable pulleys to provide a drive therebetween, the drive ratio between the pulleys being determined by the position of the pulleys movable flanges with respect to their respective fixed flanges; and

said apparatus being so constructed and arranged to provide substantially a fixed ratio drive between the drive and driven shafts at relatively low drive shaft speeds up to the first predetermined speed of the drive shaft and also to provide a substantially constant driven shaft speed for speeds of the drive shaft above the first predetermined speed to a second and higher predetermined speed of the drive shaft.

4,216,679
POWER TRANSMISSION BELT

Anderson W. Howerton, Nixa; Darrell L. Klein, and James R. Thomas, both of Springfield, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Dec. 4, 1978, Ser. No. 966,441
Int. Cl.[3] F16G 5/08, 5/22
U.S. Cl. 474—238 16 Claims



1. A multi-ribbed power transmission belt made primarily of elastomeric material for use with multi-grooved pulleys in a serpentine drive system, said belt comprising:

a. A first portion having one face defining the bottom surface of said belt and comprising a plurality of laterally spaced power-transmitting ribs, each of said ribs having a cross-sectional configuration adapted to conform to a groove of said pulley, and a groove between each adjacent rib penetrating from said bottom surface and terminating at the opposite top surface of said first portion;

b. A second portion bonded to said top surface of said first portion; and

c. A third portion having one face defining the top surface of said belt and comprising a plurality of laterally spaced power-transmitting ribs, each of said ribs having a cross-sectional configuration adapted to conform to a groove of said pulley, and a groove between each adjacent rib penetrating from said top surface of said third portion and terminating at the opposite bottom surface of said third portion; said bottom surface of said third portion being bonded to said second portion, and said third portion being symmetrical with said first portion about said second portion wherein said grooves between said adjacent ribs in said first portion and said second portion are configured to provide relief areas between said ribs and adjacent second portion to allow debris to work through said second portion and thereby become discharged.

4,216,680

TRAVEL SPEED CHANGE APPARATUS FOR A FARM VEHICLE

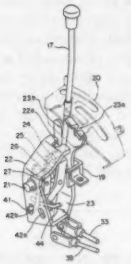
Tetsuaki Hayashi; Hideo Shiiyama, both of Sennan; Mikio Kinoshita, Izumisano, and Hiroshi Nagai, Sakai, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Aug. 21, 1978, Ser. No. 935,308

Claims priority, application Japan, May 19, 1978, 53-60507; May 19, 1978, 53-60508

Int. Cl.[2] G05G *11/00*

U.S. Cl. 74—473 R **4 Claims**



1. A travel speed change apparatus for a farm vehicle comprising a first speed change mechanism and a second speed change mechanism co-operative to change travelling speed, characterized in that, for actuating said two speed change mechanisms by means of a single hand lever (17) movable in two different directions, a first speed change operation course (A) for actuating said first speed change mechanism is provided to orientate in a first direction, auxiliary operation courses (B1), (B2) are provided to extend in a second direction respectively from plural speed change positions (Q1), (Q2) of said first speed change operation course (A), and a plurality of second speed change operation courses (C1), (C2) for actuating said second speed change mechanism are provided to extend in thr first direction respectively from said auxiliary operation courses (B1), (B2).

4,216,681

APPARATUS FOR ADJUSTING THE SLIDE STROKE OF A PRESS MACHINE

Kazuo Morisawa, Komatsu, Japan, and Rudolf Nägele, Waldstetten, Fed. Rep. of Germany, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 974,247

Int. Cl.[2] G05G *1/00*

U.S. Cl. 74—571 M **4 Claims**

1. An apparatus for adjusting the slide stroke of a press machine comprising a press frame;

a spindle rotatably mounted on said press frame;

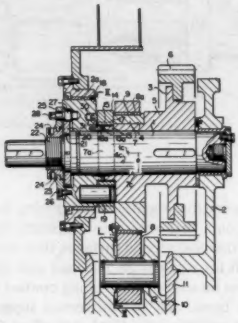
first eccentric drum means fixedly mounted on said spindle, said first eccentric drum means having first serrations formed at one end thereof;

second eccentric drum means rotatably mounted on said first eccentric drum means, said second eccentric drum means having a guide groove formed therein at one end thereof;

connecting rod means rotatably mounted on said second eccentric drum means, said connecting rod means being adapted to convert the rotary motion of said second eccentric drum means into a linear motion;

plunger means connected with said connecting rod means and adapted to move vertically with the rotation of said spindle;

a cylindrical member rotatably and slidably mounted on said



spindle, said cylindrical member having second serrations formed at one end thereof and adapted to be connectible with said first eccentric drum means by engaging the first and second serrations;

plate means rotatably mounted on said spindle and adapted to slide within the guide groove of said second eccentric drum means, said plate means being connected to said cylindrical member so as to rotate therewith;

means mounted on said spindle for selectively connecting and disconnecting said cylindrical member with and from said first eccentric drum means; and

means for rotating said cylindrical member when said cylindrical member is disconnected from said first eccentric drum means.

4,216,682

FIBER-REINFORCED LIGHT ALLOY CAST ARTICLE

Keisuke Ban, Fujimi, and Takeo Arai, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 837,043, Aug. 23, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,436

Int. Cl.[3] B22D *19/02;* B32B *7/02, 15/14*

U.S. Cl. 74—579 E **3 Claims**

1. A fiber-reinforced light alloy cast article having a light alloy matrix, including a portion filled with a shaped body of a mechanically strong inorganic fiber material of high elasticity having young's modulus of more than 15,000 kg/mm^2 and a bulk density ranging from 0.10 g/cc to 0.80 g/cc, and a sliding contact portion filled with a shaped body of a hard inorganic fiber material of low elasticity having young's modulus of less than 10,000 kg/mm^2 and a bulk density ranging from 0.30 g/cc to 1.0 g/cc, both of said shaped fiber bodies being filled into the light alloy matrix by means of high pressure solidification casting.

2. The cast article of claim 1 in the form of a connecting rod for an internal combustion engine having a rod section, a big end and a small end, wherein the rod section is reinforced with a metal fiber of high elasticity having young's modulus of more than 15,000 kg/mm^2 and a bulk density ranging from 0.10 g/cc to 0.80 g/cc, and the ends of said rod are reinforced with a

hard inorganic fiber of low elasticity having young's modulus of less than 10,000 kg/mm^2 and a bulk density ranging from 0.30 g/cc to 1.0 g/cc.

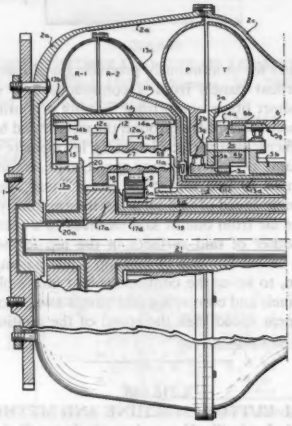
3. The cast article of claim 1 in the form of a rocker arm for an internal combustion engine having an arm portion and a slipper surface, wherein the arm portion is reinforced with a metal fiber of high elasticity having young's modulus of more than 15,000 kg/mm^2 and a bulk density ranging from 0.10 g/cc to 0.80 g/cc, and the slipper surface is reinforced with a hard inorganic fiber of low elasticity having young's modulus of less than 10,000 kg/mm^2 and a bulk density ranging from 0.30 g/cc to 1.0 g/cc.

4,216,683

AUTOMATIC TRANSMISSION

William A. Sackschewsky, 828 W. Olive St., Fort Collins, Colo. 80521

Filed Jan. 19, 1977, Ser. No. 760,285
Int. Cl.^{2} F16H *47/08*
U.S. Cl. 74—688 **16 Claims**



1. A transmission comprising:
(a) a fluid coupler having a pump to which an input is connected, and a turbine;
(b) a primary planetary gear set with a sun gear having means associated therewith for connecting said sun gear to the turbine, a planet carrier connected to an output, a planet gear and a ring gear;
(c) and means including a second planetary gear set having a ring gear attached to and rotatable with the ring gear of said primary planetary gear set for applying positive torque to the ring gear of the primary planetary gear set.

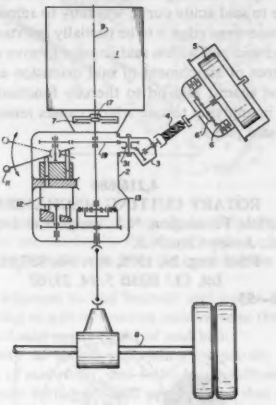
4,216,684

HYBRID DRIVE FOR MOTOR VEHICLES

Faust Hagin; Hans Hagen; Hans-Jürgen Drewitz, all of Munich; Erich Knirsch, Lohhof, and Paul Merker, Munich, all of Fed. Rep. of Germany, assignors to Maschinefabrik Augsburg-Nuenberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,790
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 2641886
Int. Cl.^{2} F16H *3/74*
U.S. Cl. 74—751 **11 Claims**

1. A hybrid drive for motor vehicles comprising a drive train including prime mover means, first clutch means (7) and standard automatic transmission means (12, 13) having a power input and a power output arranged in series whereby the direction of power flow is from said prime mover means through said first clutch means (7) to said power input of said automatic transmission means, flywheel means (5), auxiliary power take-off means (3) and second clutch means (6) operatively connecting said flywheel means (5) to said automatic transmission means (2) through said auxiliary power take-off means (3), said standard automatic transmission means comprising a mechanical power transmission branch (13) including a single planetary gear set means, a hydraulic power transmission branch (12) and a single branching gear means (19) operatively interposed between said power input and said transmission branches (12, 13), said auxiliary power take-off means (3) operatively connecting said flywheel means (5) to one meshing point of said single branching gear means (19) of said automatic transmis-



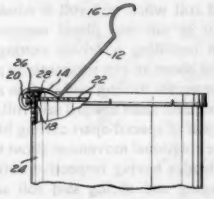
sion means (2) substantially at a point near said power input of said automatic transmission means and upstream of said single planetary gear set means (13) as viewed in said power flow direction, said branching gear means (19) being also operatively connected to said hydraulic power transmission branch (12) at a further meshing point of said same single branching gear means (19), whereby said flywheel means (5) and said hydraulic power transmission branch (12) are connected in parallel to said single branching gear means (19), and wherein said planetary gear set means, and said hydraulic power transmission branch (12), are operatively connected to said power output.

4,216,685

PAIL OPENER

John W. Taylor, Reseda, Calif.

Filed Sep. 5, 1978, Ser. No. 939,239
Int. Cl.^{3} B67B *7/00*
U.S. Cl. 81—3.46 A **3 Claims**



1. In combination with a pail, said pail having an access opening normally closed by a removable lid, the peripheral edge of said lid defining an annular groove, the upper edge of said pail about said access opening being locatable within said annular groove in a tight fitting manner, an opener facilitating the removal of said lid, said opener comprising:

an elongated straight main body section defining a first plane;

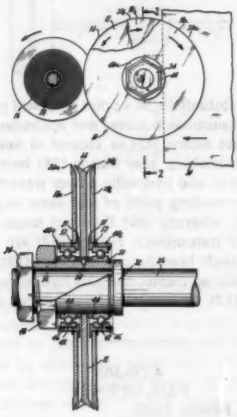
an extension depending from said main body section and being integral therewith, the attachment of said extension to said main body section forming approximately a right angle, the portion of said extension nearest said main body section having a slight curvature, the outermost portion of said extension being acutely curved and curved substantially greater than said slight curvature so that the outermost edge of said extension is essentially bent over upon itself, said acute curve being in the same direction as said slight curvature resulting in ever increasing amount of curvature in moving along said extension from said slight curve to said acute curve whereby to remove said lid the said outermost edge is to be partially inserted between said lid and said pail within said annular groove and by placing said area of attachment of said extension and main body section against said lid to thereby function as a fulcrum point in applying torque which causes removal of said lid from said pail.

4,216,686

ROTARY CUTTING MECHANISM

Carl A. Stoffels, Flemington, N.J., assignor to Judelshon Industries, Inc., Jersey City, N.J.

Filed Aug. 29, 1978, Ser. No. 937,812
Int. Cl.³ B23B 5/14, 25/02
U.S. Cl. 82—53 **12 Claims**



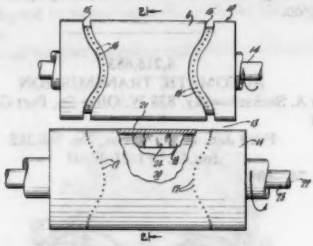
1. In a cutting mechanism for cutting an elongated roll of material along a plane substantially perpendicular to the longitudinal axis of said roll when said roll is rotated about said longitudinal axis to be cut into plural narrower rolls, said cutting mechanism including a driven cutting wheel shaft mounted for rotation about an axis substantially parallel to said longitudinal axis, means for driving said shaft in rotary motion, and means for urging said shaft toward said roll, the improvement comprising a pair of spaced-apart cutting blades mounted on said shaft for free rotational movement about the axis of said shaft, said cutting blades having respective cutting edges for cooperatively engaging and slicing said roll across a given width of said material when said shaft is urged toward said roll and said roll is rotated, and a saw blade fixedly mounted to said shaft intermediate said cutting blades and in axial alignment therewith for removing material from said roll which is present across said given width in response to said shaft being driven in rotary motion and simultaneously with the operation of said cutting blades.

4,216,687

METHOD FOR SHAPING AND/OR CUTTING BATTS OF LOOSELY COMPACTED FIBROUS MATERIALS

Anthony Passaflume, Burbank; Clarence F. Lamber, Country Hills Club, and William Dickover, Richton Park, all of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 21, 1978, Ser. No. 888,818
Int. Cl.² B26F 1/26
U.S. Cl. 83—26 **7 Claims**



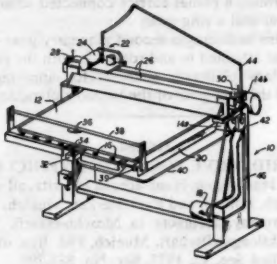
1. A method for continuously producing a plurality of individual absorbent panels from a continuous batt of loosely compacted short fibers comprising; passing a continuous batt of loosely compacted fibers through the nip formed by a pair of rotating surfaces, said surfaces rotating in opposite directions and at the same peripheral linear speed, said continuous batt being presented to said nip at the same linear speed as the peripheral linear speed of said surfaces, intermittently directing high-pressure air from one of said surfaces to a recessed portion of the other of said surfaces in the nip formed by the surfaces and across the face of said nip while passing the batt therebetween, to sever the continuous batt into a plurality of individual panels and conveying said panels away from the nip at a faster linear speed than the speed of the continuous batt being fed to said nip.

4,216,688

PANEL CUTTING MACHINE AND METHOD

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed May 26, 1978, Ser. No. 909,799
Int. Cl.² B26D 5/40, 7/28
U.S. Cl. 83—42 **7 Claims**



1. In an improved panel cutting machine of the type comprising a table, roller and conveying means for advancing a fabric onto and along said table, and cross-cutting means disposed on said table for cutting said fabric, so advanced, to a desired length to form a panel, the improvement of which comprises

means attached to said table for sensing when a leading edge of said fabric has advanced to a preselected position beyond said cross-cutting means, and

roller revolution counting means responsively connected to said roller and sensing means for de-activating said roller and conveying means and for activating said cross-cutter means when said leading edge has advanced a preselected distance beyond said position, whereby said fabric is cut to a desired length to form a panel.

5. A process for controlling the cutting of a fabric to a desired length to form a panel, the steps of which comprise

moving a fabric across and beyond a cutting line and along a table with a pair of rollers and a conveyor such that a leading edge of said fabric arrives at a position a peselected distance beyond said cutting line,

counting a preselected number of revolutions of one of said rollers commencing with the arrival of said leading edge at said position,

stopping said rollers and conveyor upon completion of the step of counting to stop the further movement of said fabric along said table, and

cutting said fabric along said cutting line commencing with the stopping of said rollers and conveyor to thereby form said panel.

4,216,689

WEIGHT CONTROLLED BREAD LOAF SLICER

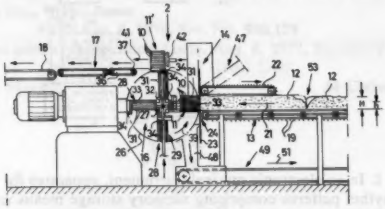
Peter Suhling, Gottlieb-Daimler-Strasse 24, 2805 Brinkum-Nord, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,242

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730843

Int. Cl.[2] B26D *4/56, 4/46*

U.S. Cl. 83—77 **29 Claims**



1. A device for making sliced portion of specific weight from a cuttable product, such as one-pound cut-bread portions for packing from loaves, comprising:

(a) a product feeder,

(b) means for controlling the speed of advance of the product feeder,

(c) a cutter unit at a head section of the product feeder, said cutting unit including a cutter blade the substantially vertically extending cutting plane of which is situated immediately in front of the head of the product feeder,

(d) a reception unit intermittently driven about a pivot axis and disposed near the cutting unit to receive the slices of at least one portion,

(e) a weigher unit for weighing each portion, the controlling means being respective to the output of said weigher unit,

(f) a conveyor for carrying off the weighed portions, and

(g) the reception unit being constructed in the form of a turret comprising a plurality of reception arms spaced by equal angles, said reception arms each having a plurality of reception pins extending in the direction of each reception arm, on which, in a reception portion of a reception arm, the slices of a portion are each pushed after cutting, and each reception arm further having a pusher guided on said reception pins for automatically removing the slices from the pins, whereby during each working cycle the turret is rotated about its pivot axis by an amount equal to the pitch angle between two reception arms.

4,216,690

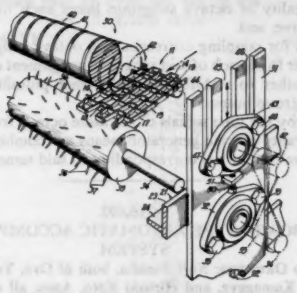
APPARATUS FOR PERFORATING SLICES OF FOOD PRODUCT

Robert F. Bullock, 1708 Iris Dr., Conyers, Ga. 30207

Filed Jan. 26, 1979, Ser. No. 6,889

Int. Cl.[2] B26D *7/06;* B26F *1/24*

U.S. Cl. 83—114 **8 Claims**



1. In an apparatus for conveying slices of food product in which the slices are carried by the upper surface of the upper flight of a moving continuous belt, the combination therewith of:

(a) a roller adjacent to and beneath said upper flight, said roller having an axis of rotation transverse to the direction of travel of said upper flight of said belt;

(b) a plurality of spikes protruding outwardly from the periphery of said roller, said roller being sufficiently close to the lower surface of said upper flight that the spikes carried by said roller project through said upper flight and outwardly of the upper surface of said upper flight; and

(c) means for retarding outward movement of said slices from said upper surface so that said slices are progressively perforated by said spikes as they are moved along their path of travel by said upper flight.

4,216,691

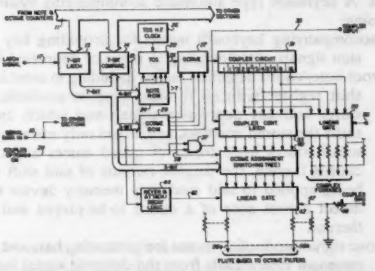
OCTAVE ASSIGNMENT SYSTEM FOR ELECTRONIC MUSICAL INSTRUMENT

Eric R. Bean, South Bend, Ind., assignor to C. G. Conn, Ltd., Oakbrook, Ill.

Filed Jan. 9, 1978, Ser. No. 867,907

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.01 **6 Claims**



1. An electronic musical instrument including in combination:

a plurality of tone generator means each capable of producing a plurality of tone signals of different frequencies in more than one of a plurality of different octaves in response to note and octave information;

a plurality of subgroup assignment circuit means each cou-

pled to a different associated tone generator means and each having a plurality of octave subgroup output leads each corresponding to a different octave, said subgroup assignment circuit means in response to at least the octave information of each tone signal coupling each tone signal to the respective octave subgroup output lead corresponding to the octave subgroup in which said tone signal belongs;

a plurality of octave subgroup buses each for a different octave; and

means for coupling corresponding octave subgroup output leads from each of said subgroup assignment circuit means together to a different one of said plurality of octave subgroup buses;

whereby the tone signals of the same octave from each of a plurality of tone generator means are combined together on an output bus corresponding to said same octave.

4,216,692

KEYBOARD TYPE AUTOMATIC ACCOMPANYING SYSTEM

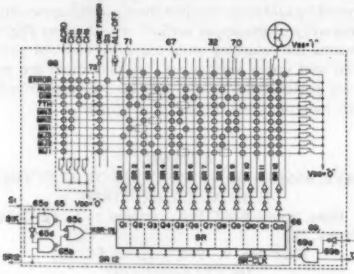
Yasuhiko Okuyama; Koji Tanaka, both of Ora; Yoshiro Nakayama, Kumagaya, and Hiroshi Kato, Ageo, all of Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jul. 5, 1978, Ser. No. 922,000

Claims priority, application Japan, Jul. 6, 1977, 52-80860; Jul. 14, 1977, 52-84546; Jul. 20, 1977, 52-86878; Sep. 5, 1977, 52-106391; Sep. 7, 1977, 52-107352; Sep. 9, 1977, 52-107980; Sep. 14, 1977, 52-110882; Oct. 12, 1977, 52-121537; Oct. 14, 1977, 52-123193

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **18 Claims**



1. A keyboard type automatic accompanying system comprising:

accompanying keyboard means for providing key depression signals corresponding to notes of depressed keys,

root note/chord detection means including in combination a shift register with all flip-flop outputs available, which stores said key depression signals and which cyclically shifts the stored contents, and a read only memory device which stores basic forms of chord names and types of chords therein, the parallel outputs of said shift register being applied to said read only memory device so as to detect a root note of a chord to-be-played and a type thereof,

tone signal production means for generating bass and accompaniment tone signals from the detected signal indicative of the root note or indicative of the root note as well as the chord type, and

output means for amplifying said tone signal and driving a loudspeaker,

wherein said read only memory device comprises

(a) a first read only memory for storing basic forms of chord names and directly comparing cyclically the shifted contents of said shift register with the stored contents of said first read only memory and detecting a coincident chord name,

(b) a second read only memory storing therein binary information representative of the type of chords, said binary information being directly read out by the coincident output of said first read only memory,

(c) an erroneous chord detection ROM line for detecting a binary information representative of an erroneous chord as one of the binary information representative of the type of chords and one of notes assigned by key depression as a root note, said erroneous chord detection ROM line being activated when any one of the parallel outputs of said shift register is "1" and in a sequence period subsequent to the chord detection sequence period, and

(d) a one-finger control line disposed in said read only memory device along parallel output lines of said shift register, thereby ceasing the operation of chord type detection in case of a one-finger chord playing mode and executing only the detection of the erroneous chord to detect the note assigned by key depression.

4,216,693

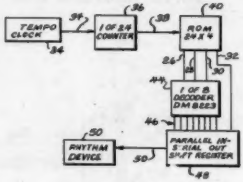
MEANS FOR STORING BASS RHYTHM PATTERNS

William V. Machanian; Anthony C. Ippolito, both of De Kalb, and William R. Hoskinson, Geneva, all of Ill., assignors to The Wurlitzer Company, De Kalb, Ill.

Filed Jun. 20, 1978, Ser. No. 917,309

Int. Cl.[2] G10H *1/00, 5/00*

U.S. Cl. 84—1.03 **7 Claims**



1. In an electronic musical instrument, apparatus for storing rhythm patterns comprising memory storage means arranged as M words by N bits wherein M defines the basic cycle of one pattern and the N bits define one combination of output states out of 2^N possible combinations, and means for transferring information from said memory storage means to a means for utilizing the rhythm patterns, wherein the memory storage means comprises a read only memory, and further wherein the read only memory comprises four columns, three of said columns storing digital information as to desired rhythm notes and the fourth column stores information as to which octave the rhythm notes should play in.

4,216,694

SOLENOID DASHPOT PEDAL ACTUATOR ASSEMBLIES

Vernon B. Ramsey, and Thomas J. Wilkes, both of Lewisburg, Tenn., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Sep. 19, 1978, Ser. No. 943,896

Int. Cl.[2] G10F *3/00*

U.S. Cl. 84—23 **10 Claims**

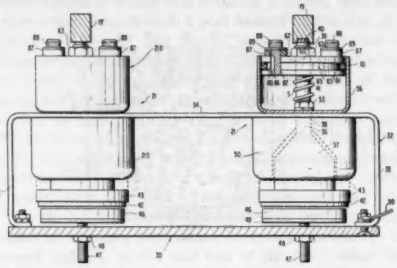
1. In a piano pedal actuator assembly having a solenoid-dashpot assembly for operating one or more foot pedals upon energization of the solenoid, improvement in the dashpot assembly of said solenoid to enable said actuator assembly to more closely approximate the action of the pianist in the depressing of the pedals of the piano and substantially reduce extraneous noise, which comprises:

a dashpot cylinder,

a piston coupled to the armature of said solenoid and moving

in said dashpot cylinder, said dashpot piston being smaller in diameter than the internal diameter of said dashpot cylinder,

an O-ring floating adjacent the periphery of said dashpot piston and engaging the walls of said dashpot cylinder, and means maintaining said O-ring at said periphery of said dashpot piston,



and at least one constricted orifice in communication with the interior cylinder space enclosed by said dashpot cylinder and said dashpot piston and through which air substantially silently egresses and ingresses to the ambient space.

4,216,695

FASTENER FOR CYMBAL MOUNTING

Masao Hoshino, Owariasahi, Japan, assignor to Hoshino Gakki Seizo, Inc., Aichi, Japan

Filed Aug. 2, 1978, Ser. No. 930,158

Claims priority, application Japan, Aug. 6, 1977, 52-105578

Int. Cl.[2] G10D *13/06*; G10G *5/00*

U.S. Cl. 84—421 **14 Claims**

1. For use with cymbals having central holes of varying sizes, a reversible one-piece fastener for mounting a cymbal, irrespective of the size of said hole, to the post of a cymbal stand or the like, said fastener comprising a body member having a cymbal-retaining flange portion intermediate a long sleeve portion and a short sleeve portion, and including means to selectively mount the body member, either long sleeve portion or short sleeve portion first, on said cymbal stand post, wherein the flange portion on the side adjacent the short sleeve portion is tapered toward the short sleeve portion, and wherein the flange portion on the side adjacent the long sleeve portion is tapered toward the long sleeve portion, and including gripping means on the flange portion for facilitating manual gripping of the fastener, and wherein the flange, long sleeve and short sleeve portions of said body member are in the general form of coaxially aligned cylinders, and wherein the means to selectively mount the body member to a cymbal post includes internal threading within a bore in at least one of the flanges, long or short sleeve portions for mating with an externally threaded cymbal stand post.

4,216,696

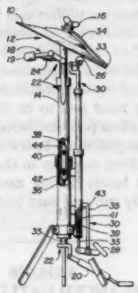
CYMBAL STAND AND ASSEMBLY

Raoul H. Alexis, Jr., 401 Cedar St., Vallejo, Calif. 94590

Filed May 11, 1979, Ser. No. 38,114

Int. Cl.[3] G10D *13/06*

U.S. Cl. 84—422 R **10 Claims**



1. A foot operated cymbal assembly, which comprises:

(a) a cymbal stand,

(b) a cymbal mounted proximate to the top of said stand,

(c) a first foot pedal positioned proximate to the bottom of said stand,

(d) a beater positioned on said stand to strike said cymbal,

(e) a linkage operatively connecting said first foot pedal and said beater,

(f) a second foot pedal positioned proximate to the bottom of said stand,

(g) a cymbal vibration damper positioned on said stand for selective engagement with said cymbal, and

(h) a linkage operatively connecting said second foot pedal and said cymbal vibration damper.

4,216,697

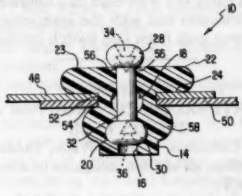
TWO-PIECE REUSABLE FASTENER

Leroy Wilson, P.O. Box 203, Manhattan, Kans. 66502

Filed Dec. 12, 1978, Ser. No. 968,778

Int. Cl.[3] F16B *13/06*

U.S. Cl. 85—70 **1 Claim**



1. A two-piece reusable fastener, which comprises:

an anchor having an elongated flexible shank adapted to fit through aligned apertures formed respectively in two members which are to be fastened together,

the shank having two ends, one of which comprises an enlarged retaining head, and an axial bore which extends longitudinally through said retaining head and said shank; and

means disposed wholly within said bore and adapted to be moved in a first direction therein for locking said anchor

on both sides of said members and in a second direction therein for unlocking and thereby releasing said anchor from said members, the means comprising a locking member having a central substantially cylindrical portion of approximately the same diameter as that of said bore, a first enlarged head having a lower surface and formed at one end of said central portion, and a second enlarged head, which is larger in diameter than the first and positioned within said bore at the other end of said central portion and opposite to that on which said retaining head is formed, said second enlarged head being sized to remain in its initial position within said bore as said locking member is moved towards said retaining head, thereby causing the other end of said shank to bulge outwardly,

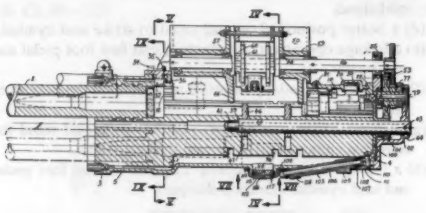
said first enlarged head being sized to be forced through said bore when said locking member is being moved towards said retaining head and to be forced entirely out of said bore in the locked position, whereby the lower surface of said first enlarged head bears on said retaining head to retain the locking member in the locked position, each of said enlarged heads having means for engagement by a tool for axially moving said locking member within said bore.

4,216,698

BALANCED GATLING GUN

Robert E. Chiabrandy, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Sep. 25, 1978, Ser. No. 945,657
Int. Cl.[2] F41D *7/04*; F16H *25/12*
U.S. Cl. 89—12 **8 Claims**



1. In a cam and a cam follower journaled for relative mutual rotation and having a cam track adapted to guide said cam follower and containing an intersection of cam paths,

the improvement of a rotating crossover switch mechanism containing a crossover guide slot, said crossover switch mechanism being positively driven sequentially to align an end of said guide slot with each cam follower entering said switch mechanism and with the appropriate cam path as each follower exits from said switch mechanism.

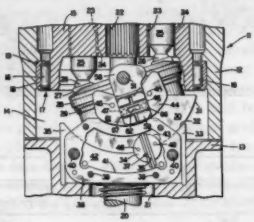
4,216,699

ELECTROHYDRAULIC CONTROL FOR AN AXIAL PISTON PUMP

Ellis H. Born, Columbus; Paul B. Wolfe, Dublin, and Leo H. Dillon, Columbus, all of Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,311
Int. Cl.[2] F15B *13/16, 13/044*; F01L *21/02*
U.S. Cl. 91—3 **10 Claims**

1. A control for an axial piston pump having a housing, a cover plate closing an opening in the housing, a pair of fluid ports, a pivotably mounted thrust plate for changing the displacement of the device, a fluid motor for pivoting the thrust plate between a position of maximum fluid displacement in one direction and a position of maximum fluid displacement in the other direction with a centered position of minimum fluid displacement therebetween, means for supplying servo pressure fluid to operate said fluid motor including an input device for selectively operating the fluid motor to move the thrust plate to the position set by the input device, and the improvement comprising: a servo actuator including an electric force motor, a pilot stage and a main stage, wherein the force motor provides a signal to the pilot stage proportional to the magnitude of the electrical input to the motor, the pilot stage provides a fluid input to the main stage proportional to the signal it receives from the force motor; means for supplying servo



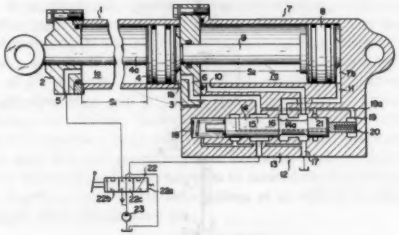
pressure fluid to said pilot stage; means for connecting the main stage of the servo actuator with the input device so that said input device moves in response to movement of the main stage; a feedback mechanism connected between the input device and the pilot stage; means for manually operating said input device; and said manual operating means being able to operate said input device when the supply of servo pressure fluid to the pilot stage is interrupted.

4,216,700

ACTUATOR DEVICE FOR ACTUATING EJECTOR OF SCRAPER

Akio Iida, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 14, 1978, Ser. No. 915,163
Claims priority, application Japan, Jun. 14, 1977, 52-76715[U]
Int. Cl.[3] F01B *7/00*; F15B *11/16, 13/06*
U.S. Cl. 91—170 R **1 Claim**



1. An actuator device comprising:

(a) a first actuator having two ends which are closed by a first cap and a second cap, and in which a first piston is slidably accommodated and which has pressurized fluid supply and discharging ports formed at both ends thereof, said first piston having a top surface and a bottom face and a piston rod projecting through said first cap extending from said top surface;

(b) a second actuator having an open end closed by said second cap of said first actuator, said second actuator having a second piston slidably accommodated therein, said second piston having a piston rod extending through said second cap, said piston rod arranged opposite to the bottom face of the first piston and adapted to abut said bottom face, said second actuator having pressurized fluid supply and discharging ports formed in both ends thereof;

(c) a slide valve including a valve body formed as an integral part of the second actuator, said valve body having a

spool slidably accommodated therein and biased by a spring in one direction;

(d) a load piston slidably mounted within a pressure chamber formed within said valve body on the opposite side of said spring, said load piston abutting against the rear end of said spool, said slide valve including a first inlet port which communicates with a port formed on the side of a bottom chamber of said first actuator, a second inlet port which communicates with a port formed on the side of a bottom chamber of said second actuator and which is permitted to communicate with said first inlet port when said spool is moved against the resilient force of the spring, a drain port which is normally communicated with said second inlet port and is cut off from communication with the latter when the spool is moved against the biasing force of the spring and which always communicates with a port formed on the side of a rod chamber of said second actuator and a port which communicates said first inlet port with said pressure chamber, said slide vlave including further an auxiliary port which leads to a chamber to be formed opposite to the rear end of the spool when the spool has been moved against the spring so as to permit communication between said chamber formed opposite to the rear end of the spool and said first inlet port; and

(e) an operating valve adapted to selectively supply the pressurized fluid delivered by a pump into either a port formed on the side of a rod chamber of said first actuator or the first inlet port of said slide valve,

wherein the stroke of said first actuator is longer than that of said second actuator.

4,216,701

SWING TYPE HYDRAULIC SERVO-ACTUATOR

Kiyoshi Komoriya, Tokyo, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Technology, both of Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,410
Claims priority, application Japan, Mar. 25, 1977, 52-33044
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—49 **4 Claims**

1. A swing type hydraulic servo-actuator which comprises

(a) a casing defining an oil chamber,

(b) a first shaft having a vane extending into the oil chamber and dividing the oil chamber into a first drive chamber and a second drive chamber,

(c) oil feeding passages arranged to feed oil under pressure respectively to the first and second drive chambers,

(1) the vane being adapted to swing inside the oil chamber from the neutral position under respective static pressures produced by the oil fed into the first and second drive chambers,

(d) a variable restrictor in each oil feeding passage for adjusting the pressure, the variably restrictors simultaneously adjusting the amounts of oil fed under pressure to the drive chambers,

(e) a second shaft disposed coaxially relative to the first shaft, one of the shafts being rotatably displaceable relative to the other shaft, and

(f) oil discharge passages respectively in communication with the first and second drive chambers when the first shaft is in the neutral position relative to the second shaft for discharging the oil from the drive chambers,

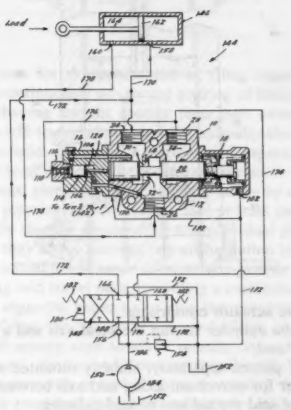
(1) the oil flow through the discharge passages being controlled by the relative rotary displacement between the shafts so that the oil flow through one of the discharge passages in communication with one of the drive chambers increases proportionally to a decrease in the oil flow through the other discharge passage in communication with the other drive chamber.

4,216,702

PRESSURE SENSING REGENERATIVE HYDRAULIC SYSTEM

Clayton L. Brundidge, Rochester, and William H. Bechman, Williamsville, both of N.Y., assignors to Eaton Yale Ltd., Ontario, Canada

Filed May 1, 1978, Ser. No. 901,545
Int. Cl.[2] F15B *13/042*; G05D *11/02*
U.S. Cl. 91—436 **13 Claims**



1. A pressure sensing valve comprising:

a housing having a longitudinal bore therein;

a plurality of ports in fluid communication with said bore at spaced points therealong;

valve plunger means disposed within said bore for slidable displacement between first and second positions to selectively interconnect a first pair of said ports for fluid communication therebetween in said first position and a second pair of said parts for fluid communication therebetween in said second position;

biasing means urging said plunger means axially towards said first position;

first and second pilot pistons slidably disposed in first and second pilot bores respectively, said first pilot piston of a diameter substantially smaller than that of said second pilot piston, said pilot bores being disposed substantially coaxially with said longitudinal bore, said second pilot bore communicating with said longitudinal bore through said first pilot bore wherein one end of said first pilot piston abuts one end of said second pilot piston and the other end of said first pilot piston abuts one end of said plunger means while in said first position, said first pilot piston having at least one flat means partially therealong to establish fluid communication between said second pilot bore and said longitudinal bore after said first pilot piston has been axially displaced a predetermined increment of distance while urging said valve plunger means from said first position to said second position;

a first fluid path interconnecting one of said ports with said second pilot bore for transmitting fluid pressure to simultaneously urge the first pilot piston against said plunger

means and the second pilot piston away from said plunger means; and

a second fluid path interconnecting another of said ports with said second pilot bore for transmitting fluid pressure to urge the second pilot piston against the first pilot piston.

4,216,703

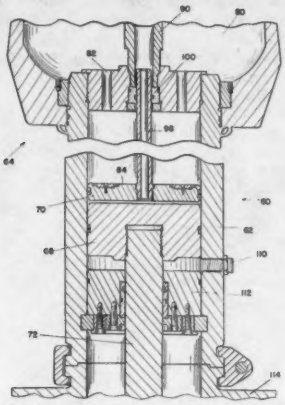
VALVE ACTUATOR

E. Frederick Schoeneweis, Kearney, Nebr., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 17, 1978, Ser. No. 897,061

Int. Cl.[2] F01B *7/02, 31/18*

U.S. Cl. 92—63 **3 Claims**



1. A valve actuator comprising:

a hydraulic cylinder having a central axis and a first and a second end;

a pair of pistons separately, slidably mounted within said cylinder for movement along said axis between said first end and said second end of said cylinder;

an actuator rod joined at a first side of a first piston of said pair, extending through an opening in said first end of said cylinder for sealed, sliding movement therethrough and terminating at an extended end thereof which is capable of being joined to a valve stem outwardly of said cylinder;

a high pressure gas accumulator mounted on said cylinder, said accumulator having a pressure wall which is intersected by said cylinder to locate said second end of said cylinder within said accumulator;

said second end of said cylinder having an end closure structure with access port means therethrough to allow communication of an interior of said accumulator with a first side of a second piston of said pair;

said cylinder having an access hole therethrough at said first end thereof for supplying hydraulic fluid from a first source to said cylinder to act on said first side of said first piston to cause adjacent second sides of said first and said second pistons to make abuting contact as said first and said second pistons are moved toward said second end of said cylinder in opposition to the high pressure gas of said accumulator and for discharging said fluid to allow said high pressure gas to act on said first side of said second piston to cause movement of said first and said second pistons toward said first end of said cylinder;

a tubular housing at least partially disposed within said accumulator and aligned with said axis to extend from said end closure structure through a portion of said pressure wall aligned with said axis, said tubular housing having an extended fitting external of said pressure wall;

a hollow tube extending from said first side of said second piston along said axis into said tubular housing to make sliding, sealed contact therewith at an end of said tubular housing adjacent said end closure structure, said second piston having a center opening therethrough to allow communication between the interior of said hollow tube and a space between said second sides of said first and said second pistons; and

said extended fitting providing means for introducing hydraulic fluid from a second source through said hollow tube and between said first and said second pistons to cause movement of said first piston toward said first end of said cylinder if said high pressure gas is unavailable to act on said first side of said second piston.

4,216,704

PISTON FOR A HYDROSTATIC AXIAL-PISTON MACHINE

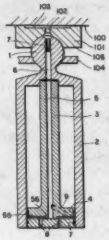
Walter Heyl, Johannesburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 23, 1977, Ser. No. 854,051

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1976, 2653866

Int. Cl.[2] F15B *21/04*

U.S. Cl. 92—78 **1 Claim**



1. A piston for a hydrostatic axial-piston machine, comprising:

a hollow cylindrical piston body formed at one end with a head of ball configuration engageable with a slide shoe adapted to form a pressure cushion against a reaction surface relative to which the shoe is displaceable, and open at the other end of said piston body, said head being formed with a first passage for communicating with a pressure cushion and having a throttle constriction in the ball for delivering a pressure medium to a pressure cushion through said throttle constriction;

a separate cover affixed to said other end of said body and formed with at least one wall closing the interior thereof and provided with an axially extending second passage communicating between an end face of said body and the interior thereof;

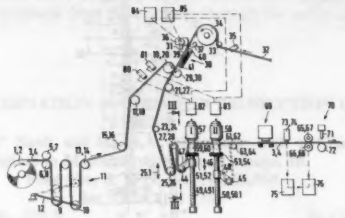
a separate member received in the interior of said body and including an elongated stem radially spaced from an inner cylindrical surface of said body and provided with a throughgoing axial bore registering with said first passage, and an annular flange extending outwardly from said stem and sealing against an inner cylindrical surface of said body; and

a third passage defining a planar gap filter communicating between said second passage and said bore, said planar gap filter being defined by a space between adjacent planar opposed surfaces on said cover and said annular flange and having an axial width of about 0.2 to 0.3 mm and sufficiently small to prevent particles capable of obstructing said constriction from reaching same.

4,216,705
APPARATUS FOR MAKING CARRIER BAGS FROM TWO HALF-TUBES RUNNING SIDE-BY-SIDE

Fritz Achelpohl, and Friedhelm Mundus, both of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,667
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2744233
Int. Cl.[2] B31B *1/86*
U.S. Cl. 93—33 H 7 Claims



1. Apparatus for making carrier bags from pairs of preprinted plastics half tubes having printed marks thereon, said apparatus comprising:

means for moving the pairs of tubes side-by-side in parallel through said apparatus;

first means for turning and folding back at least one edge of each tube to thereby expose inner marginal zones of each half tube;

second means including a station for applying handle hole reinforcing strips to the exposed inner marginal zones;

handle hole punches for punching holes in portions of both tubes reinforced by the strips;

transverse welding and separating means for simultaneously transversely welding said tubes to thereby form and separate individual bags from both tubes;

said second means including:

means for supporting a web of reinforcing strips;

means including rotating knives for severing individual strips from the web;

means for moving said web from said supporting means to said severing means;

conveying means for conveying severed strips to the station for applying the strips to the tubes;

first photocell means for scanning and for generating first signals representative of printed marks on each of the webs;

means for sensing and for generating second signals representative of phase positions of said knives of said means for severing; and

means for comparing said first and said second signals and for generating control signals when the sensed positions of the printed marks on the tubes relative to the phase positions of corresponding ones of said knives exceed predetermined values;

said means for moving including:

loop-forming indexing rollers associated with each half tube and positioned downstream of the station for applying reinforcing strips;

electric motors for independently controlling the positions of each of said indexing rollers, said motors being responsive to respective ones of said control signals so that the positions of the rollers are determined by the relationship between sensed printed marks on the tubes and sensed phase positions of said knives;

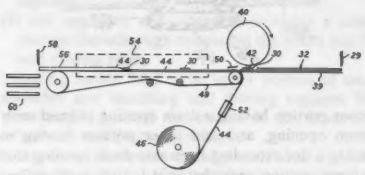
feeding means for feeding tubes from said indexing rollers to said transverse welding and separating means; and

second photocell means for sensing printed marks on the tubes and for independently stopping said feeding means so that the tubes are correctly positioned with respect to said transverse welding and separating means.

4,216,706
MANUFACTURE OF SMOKING ARTICLES

Stanley W. Byrne, No. Crawley, England, assignor to American Filtrona Corporation, Richmond, Va.

Filed Aug. 23, 1978, Ser. No. 935,900
Claims priority, application United Kingdom, Sep. 5, 1977, 37002/77
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—77 FT 8 Claims



1. A process for the production of filter cigarette tubes comprising continuously advancing a string of tobacco smoke filter plugs having lengths greater than their cross-sectional diameters in end-to-end abutment longitudinally along a travel path that includes a separator station, said separator station including at least one piercing means and means to move said piercing means, piercing each plug of the string by one of said at least one piercing means, moving said at least one piercing means rapidly thereby accelerating the individual plugs longitudinally as they arrive successively at the station to space the plugs longitudinally a distance substantially greater than their lengths along said travel path, providing a continuous advancing tape of cigarette paper to receive the previously spaced plugs, supplying the previously spaced plugs continuously onto said advancing tape to allow nonslip contact with said cigarette paper, continuously enwrapping the cigarette paper around the previously spaced plugs, and severing the resulting continuously produced tube into individual unfilled tubes of finite length.

6. Apparatus for producing tubes for filter cigarettes, the apparatus comprising means for continuously advancing a string of end-to-end abutting tobacco smoke filter plugs having lengths greater than their cross-sectional diameters, longitudinally along a travel path; a separator including a piercing means and means for moving said piercing means on the travel path operable to accelerate longitudinally individual plugs as they arrive successively thereat to space them longitudinally a distance substantially greater than their lengths along the travel path; means for continuously advancing a tape of cigarette paper to receive said previously spaced plugs in non-slip contact thereon; a wrapping garniture for receiving the previously spaced advancing plugs and paper and forming same continuously into a wrapped tube of spaced plugs; and a cutter for severing the resulting continuously produced tube into individual tubes of finite length.

4,216,707
AIR VENTING SYSTEM FOR AUTOMOTIVE VEHICLES

Clifford Pennington, 19371 Ashton, Detroit, Mich. 48219

Filed Jul. 11, 1978, Ser. No. 923,580
Int. Cl.[2] B60H *1/00;* E04F *19/08;* B60J *9/00*
U.S. Cl. 98—2 3 Claims

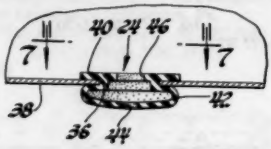
1. In a vehicle, a combination comprising:

a hollow vehicle body structure having a bottom wall having a bottom opening;

a plug formed of a resilient material and removably mounted in said bottom opening, said plug having an inner portion and an outer portion, said inner portion being supported

above said outer portion, each of said portions having a diameter greater than that of said bottom opening, at least one of said portions being resiliently deformable to a diameter permitting passage thereof through said bottom opening, and said inner portion and said outer portion being disposed on opposite sides of said wall;

said outer portion having an opening permitting the passage of water therethrough;



said inner portion having a drain opening aligned with said bottom opening, and said inner portion having means forming a slot extending from said drain opening through the inner portion such that said bottom wall defines the bottom of the slot to permit water to pass in contact with said bottom wall to a position in which it is received in said bottom opening.

4,216,708

FUME CONTAINMENT

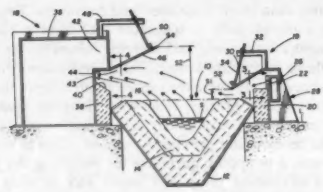
John G. Wyatt, Hall Green, and Kenneth R. Parker, Sutton Coldfield, both of England, assignors to Lodge-Cottrell Limited, Birmingham, England

Filed Nov. 13, 1978, Ser. No. 959,547

Claims priority, application United Kingdom, Nov. 21, 1977, 48328/77

Int. Cl.[2] **F23J** *11/08*

U.S. Cl. 98—36 **16 Claims**



1. A flow assembly for molten material which comprises:

(a) refractory-lined runner means for flow of molten material therealong and comprising an open stretch;

(b) gas flow means adjacent one side of the runner for directing a gas curtain across the open stretch of runner to contain fume emanating from the surface of the molten material;

(c) gas cleaning means;

(d) exhaust means adjacent the other side of the runner for exhausting the gas curtain through the gas cleaning means; and wherein:

(e) the gas flow means comprises a baffle which is downwardly inclined towards the exhaust means; and

(f) the exhaust means comprises a baffle which is upwardly inclined towards the gas flow means.

4,216,709

CHIMNEY

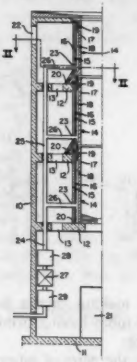
Hermann Bottenbruch, Düsseldorf, Fed. Rep. of Germany, assignor to Karrena GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 14, 1978, Ser. No. 972,714

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841570

Int. Cl.[2] **E04F** *17/02;* **F23L** *17/02*

U.S. Cl. 98—58 **13 Claims**



1. A chimney comprising external shaft, an inner lining sub-divided into several portions arranged one above the other and each said portion including an outer shell and an inner shell defining an annular space therebetween, a support construction connected to the shaft for supporting said portions of said inner lining spaced from the shaft to define a free space between said shaft and said inner lining and air in said annular space between said outer shell and said inner shell at a higher pressure than the pressure of flue gas flowing up the chimney.

4,216,710

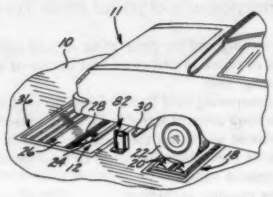
VEHICLE EXHAUST HANDLING SYSTEM

Carl J. Asmus, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed Sep. 25, 1978, Ser. No. 945,554

Int. Cl.[2] **F23J** *11/02*

U.S. Cl. 98—115 R **20 Claims**



1. An automotive engine exhaust products removing system comprising:

a floor upon which a vehicle may be driven, the floor having at least one upwardly opening chamber therein and an exhaust outlet opening operatively connected to the chamber;

at least one hinged shutter partially covering the chamber, the shutter being movable between a closed position wherein a top surface thereof lies substantially flush with the floor, and an open position wherein the shutter is raised above the floor to an angular position;

a grate positioned rearward of the shutter and over the chamber;

an additional shutter positioned below the grate, the shutter being movable between a closed position wherein it substantially impedes a flow of air and exhaust products through the grate, and an open position wherein the flow of air and exhaust products through the grate is substantially unobstructed;

first means for selectively opening and closing the hinged shutter;

second means for selectively opening and closing the additional shutter, and

third means for evacuating air and automotive engine exhaust products from the chamber through the outlet opening.

4,216,711

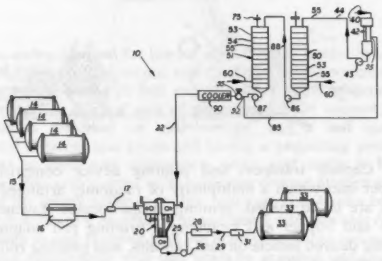
DEOXYGENATION SYSTEM FOR PRODUCTION OF BEER

Sigmund P. Skoli, and Harry G. Mojonnier, both of Chicago, Ill., assignors to Mojonnier Bros. Co., Chicago, Ill.

Filed May 5, 1979, Ser. No. 36,069

Int. Cl.[2] C12G *3/04*

U.S. Cl. 99—277.2 **14 Claims**



1. A system for producing beer and like extensively deaerated beverages, comprising, in combination, deoxygenating column means connected to a remote source of water, the column means including a fluid exhaust pump unit bottom, at least one deoxygenating unit mounted atop the pump unit, the deoxygenating unit including an outer unit wall, a foraminous baffle sheet extending inwardly from the wall, and a stack member extending upwardly from the baffle sheet, the wall, sheet and stack together forming a foraminous-bottom retainer for temporarily retaining water, the retained water forming a first gas barrier, and the water falling from the foraminous sheet being brought into first intimate contact with upwardly flowing gas, the system further including a remote source of heavy beer, a proportioner unit connected to the deoxytenating column means to receive deoxygenated water from the column means, the proportioner also being connected to receive heavy beer from the heavy beer source, the proportioner including means for mixing the heavy beer and the deoxygenated water in preselected proportions to form bright beer, and exhaust line means for carrying the mixed bright beer away from the proportioner.

4,216,712

CORING APPARATUS FOR FRUIT AND THE LIKE

James E. Altman, 105 Altman Rd., Gray, Ga. 31032

Continuation-in-part of Ser. No. 722,126, Sep. 10, 1976, abandoned. This application Nov. 6, 1978, Ser. No. 958,176

Int. Cl.[2] A23N *4/18*

U.S. Cl. 99—565 **6 Claims**

1. A coring apparatus for fruit and the like comprising

(A) a rigid upright supporting frame assembly,

(B) a vertical blade assembly including

(1) a vertical blade segment in the form of an elongated tubular member with uniform relatively thin side walls and having a lower end cross sectionally circular cutting edge,

(2) a bearing segment in the form of a cylindrical member having a channel axially defined therethrough and further having annular radial and thrust bearing surfaces defined on circumferentially outer surfaces thereof,

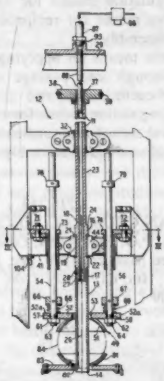
(3) connection means joining said blade and bearing segments together in fixed but inseparable, end-to-end coaxial, corotational interrelationship,

(4) and a driving segment in the form of an upwardly extending substantially elongated tubular extension from said bearing segment and having a lower end coaxially and corotatively connected to said bearing segment,

(5) said segments and extension providng a continuous passage therethrough opening at the lower end through said cutting edge;

(C) bearing means fixed to an upper portion of said frame assembly and mounting said driving segment for rotational and reciprocal movements of said blade assembly relative to said frame assembly;

(D) first drive means functionally associated with said driving segment for rotating said blade assembly, said first drive means including a power head and power transfer means interconnecting said power head with said driving segment;



(E) a carriage assembly vertically reciprocally mounted to said frame assembly and adapted to make reciprocal movements relative thereto in a plane parallel to the axis defined by said blade assembly, including bearing means for said reciprocal movements;

(F) thrust type bearing means fixed to said carriage assembly and rotatably mounting said bearing segment at said bearing surfaces thereof for drivably vertically reciprocally moving said blade assembly while the blade assembly is continuously rotated by said first drive means;

(G) second drive means comprising rectilinear fluid cylinder actuator means having relatively reciprocable parts one of which parts is mounted in fixed position on said frame assembly and the other of which parts is functionally attached to said carriage assembly for reciprocating said carriage between an upper and a lower position relative to said frame assembly in the relative reciprocation of said parts, said actuator being oriented on a vertical operating axis substantially parallel to the axis of said blade assembly;

(H) fruit supporting means associated with said frame assembly spaced below said blade assembly, said fruit supporting means being adapted to support a fruit member in a fixed core removal position alligned in normally spaced relation under said cutting edge, and having a coaxial

clearance aperture for passing therethrough of said blade segment;

(I) fruit hold down means in circumferentially adjacent clearance relationship to the outer side of said blade segment and in cooperative allignment with said supply means and including a pair of arms supporting said hold down means in suspended relation from said carriage assembly in non-rotatable orientation relative to said blade assembly so that said hold down means will move with said carriage and said blade assembly into and out of engagement with a fruit supported on said supporting means in position to be cored by said blade segment, said arms including lost motion means connecting said arms to said carriage and permitting said blade assembly to advance independently of said fruit hold down means after said fruit hold down means has engaged a fruit to be cored, said lost motion means through said arms holding said hold down means against rotation;

(J) said fruit supporting means and said fruit hold down means being adapted to cooperate in axially spaced relationship to one another with a fruit to be cored held by and between them during advance of said blade assembly by downward movement of said carriage to said lower position as effected by said second drive means to drive the rotating blade segment cutting edge through said hold down means and said fruit and said supporting means whereby to cut the core from said fruit;

(K) drive regulation means for cyclically operating said second drive means for reciprocating said carriage and said blade assembly;

(L) core ejector means for applying downwardly exertable pressure through said passage of said blade assembly toward said cutting edge; and

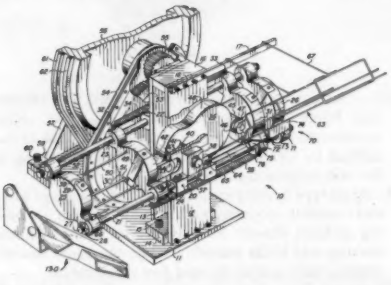
(M) pressure regulation means for cyclically operating said core removal means in coordinated relation with coring operations of said blade assembly.

4,216,713

CAN CRUSHING MECHANISM

William E. Jung, P.O. Box 16984, Orlando, Fla. 32811

Filed Mar. 26, 1979, Ser. No. 23,586
Int. Cl.[3] B30B *1/06, 9/32*
U.S. Cl. 100—209 **24 Claims**



1. A can crushing mechanism comprising in combination:

a frame;

a plurality of guide rods attached to said frame;

a pair of anvils, each anvil mounted to said guide rods;

a pair of sliding rams slidably mounted to said guide rods;

can support means for supporting a can between each said anvil and one sliding ram;

ram drive means for driving each of said pair of rams sequentially in a timed sequence, said ram drive means being attached to said frame and operatively connected to each said sliding ram; and

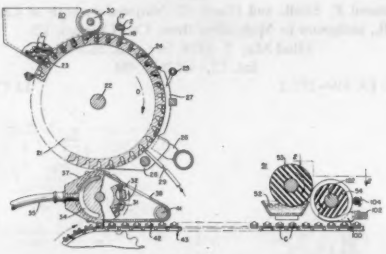
can feed means for feeding cans between each said anvil and one sliding ram, said can feed means having a chute, a can stop and a reciprocating cam actuated to shift said can stop to release one can at a time, each reciprocating cam being operatively attached to one sliding ram so that each said cam is released in a timed sequence with the movement of each said ram, whereby cans fed to said can crushing mechanism can be alternately crushed by said sliding rams.

4,216,714

METHOD AND APPARATUS FOR RESTRAINING CAPSULE ADHERENCE TO THE PRINTING ROLL

Charles E. Ackley, Sr., Oreland, and Charles E. Ackley, Jr., Philadelphia, both of Pa., assignors to R. W. Hartnett Company, Philadelphia, Pa.

Filed Sep. 11, 1978, Ser. No. 941,292
Int. Cl.[2] B41F *17/36;* **B65G** *47/24*
U.S. Cl. 101—40 **6 Claims**



1. Capsule transport and printing device comprising a hopper into which a multiplicity of randomly arranged capsules are to be loaded, printing means located downstream from said hopper and including a printing roll adapted to imprint desired indicia on said capsules, said printing roll having both an approach and exit side, transport means arranged to receive capsules from said hopper and to transport them to said printing means, and capsule restraining means adjacent said printing roll to restrain capsules against adherence to said printing roll after the desired indicia have been imprinted on them, said capsule restraining means comprising a stripper plate interposed between said printing roll and said transport device, said printing roll comprising at least one circumferential groove therein, said stripper plate comprising a substantially arcuate top surface and a bottom surface, said substantially arcuate top surface being received in said circumferential groove, said bottom surface having a leading generally arcuate shaped edge totally disposed within said circumferential groove and disposed proximate the approach side of said printing roll and a substantially planar trailing edge positioned proximate the exit side of said printing roll and adapted to bear upon said capsules after they have been imprinted upon.

4,216,715

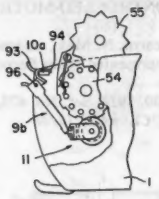
CARTRIDGE-TYPE INK SUPPLY DEVICE FOR LABELING MACHINES

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Division of Ser. No. 864,228, Dec. 27, 1977, Pat. No. 4,164,182, which is a division of Ser. No. 663,693, Mar. 4, 1976, Pat. No. 4,083,300, which is a continuation-in-part of Ser. No. 539,842, Jan. 9, 1975, abandoned. This application Apr. 3, 1979, Ser. No. 26,762
Claims priority, application Japan, Mar. 6, 1975, 50-26525
Int. Cl.[3] B41F *1/02, 1/46;* **B41J** *27/10*
U.S. Cl. 101—103 **1 Claim**

1. In an ink supply device for supplying ink onto a type surface of a printing mechanism used for printing inscriptions on each of a series of labels fed by indexed movement along a travel path thereof within a labeling machine, said ink supply device comprising an ink roller cartridge holder having at one

end thereof a part adapted for supporting and attaching the ink supply device onto the labeling machine and having at the other end a U-shaped inking roller adapted for detachably engagement with an inking roller cartridge having therein at least one inking roller: an improvement wherein said cartridge holder comprises, at upper end thereof, a pivot pin supported adjacent said printing mechanism parallel to the axis thereof and between the opposed side walls of the labeling frame, a fingerhold tab having integrally a pair of elongate gripping jaws adapted to snugly but detachably fit over a beam having rectangular cross section and supported fixedly adjacent said printing mechanism parallel to the axis thereof and between the opposed side walls of the labeling machine frame, and a



torsion spring adapted for biasing the cartridge holder toward type face about said pivot pin; said cartridge holder comprising further, at the lower or free end thereof, a tenon adapted to engage with a mortise part of the inking roller support, an indentation provided on said mortise, and a leaf spring mounted adjacent said tenon and having a projecting portion adapted to enter said indentation when said tenon is fully inserted into said mortise so as to secure correct aligned position of the inking roller cartridge; said cartridge holder being easily and securely mountable on and easily dismountable from said beam as said gripping jaws are manipulated into and out of gripping engagement with said beam by grasping said fingerhold tab.

4,216,716

APPARATUS FOR SQUEEGEE GUIDANCE IN SCREEN PRINTER

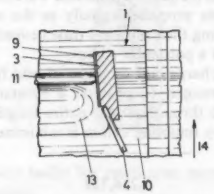
Johannes Zimmer, Ebentaler Strasse 133, A-9020 Klagenfurt, Austria

Continuation of Ser. No. 721,589, Sep. 8, 1976, abandoned. This application Jul. 11, 1978, Ser. No. 923,944

Claims priority, application Austria, Sep. 12, 1975, 7040/75; May 11, 1976, 3445/76

Int. Cl.[2] B41F *15/44*

U.S. Cl. 101—120 **8 Claims**



1. An apparatus for treating advancing sheet material with a pool of liquid substance in a controlled manner, said apparatus comprising: a perforated screen, a rolling squeegee for the application of said substance onto said material through cooperation with said screen; sealing plate means being adjustably disposed above said screen for cooperation with said squeegee, said sealing plate means having side plate members adapted to be positioned with respect to said squeegee for laterally limiting the pool of said substance; and sealing plate means further comprising at least one-wall portion inclined with respect to one direction of travel of said material with respect to said squeegee, said sealing plate means being adjustably mounted by support means and a bottom surface of said sealing plate means being in a portion of said pool, spaced from said screen to form an adjustable gap between the bottom surface of said sealing plate means and said screen.

4,216,717

SCREEN PRINTING APPARATUS

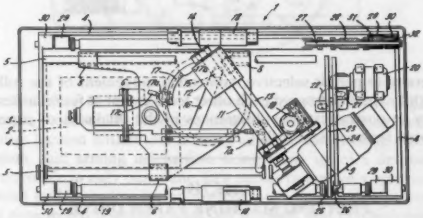
Charles E. Hall, and Royston Moore, both of Weymouth, England, assignors to DEK Printing Machine Limited, Granby Industrial Estate, Great Britain

Filed Mar. 31, 1978, Ser. No. 892,372

Claims priority, application United Kingdom, Apr. 1, 1977, 13871/77

Int. Cl.[2] B41F *15/42;* **F16H** *25/10, 25/20*

U.S. Cl. 101—123 **5 Claims**



1. In a screen printing machine having drive means for reciprocating a carriage mounted squeegee on guide rails, said drive means including a motor driven lead screw and a rider on said lead screw, said lead screw having two oppositely handed threads thereon such that rotation of said drive motor causes reciprocating motion of said rider longitudinally of said lead screw at substantially uniform speed, said rider coupled to said carriage for stroke adjustment of said carriage, the improvement comprising:

stroke adjustment means having a pivotal member pivotally mounted on said carriage and having a slot therein along which said rider can be reciprocated, pivotal movemen tof said pivotal member being effective to adjust the angle of said slot relative to the direction of travel of said rider on said lead screw and thus the stroke of said carriage and of said squeegee with respect to the stroke of said lead screw.

4,216,718

MECHANISM FOR ADJUSTING BLANKET-TO-BLANKET SQUEEZE OF PERFECTING PRESS

Harold W. Gaston; Ronald D. Welborn, and Samuel G. Humphreys, all of Emporia, Kans., assignors to Didde-Glaser, Incorporated, Emporia, Kans.

Filed May 8, 1978, Ser. No. 903,665

Int. Cl.[2] B41F *7/02, 7/12*

U.S. Cl. 101—144 **13 Claims**

1. In a printing press having a pair of cooperable printing rolls operable to receive a paper web therebetween and mounted on a frame by structure which permits fine adjustment of the spatial relationship between said rolls comprising:

a pair of opposed plates each having an elongated slit extending inwardly from one edge thereof, only a part of the width of a corresponding plate,

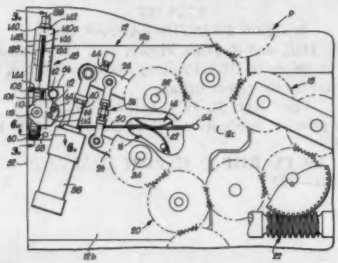
said slits being aligned and of approximately the same length;

means on each plate supporting one end of corresponding paper receiving rolls,

one of said rolls being mounted on one side of said slits and the other roll being mounted on the opposite side of the slits; and

selectively operable, manually manipulable mechanism ad-

justably carried by said plates in bridging relationship to said slits for positively prying opposed portions of the plates apart or pulling them together across said slits against the inherent, yieldable resistance derived from the integral connection of the plate portions at the terminal ends of the slits remote from the openings presented



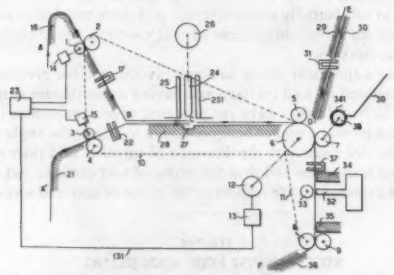
thereby to permit selective, controlled movement of the rolls slightly apart or toward each other to an extent as found necessary to compensate for differences in the thickness of paper passed between said rolls.

4,216,719

PRINTING MACHINE PAPER DRIVE

Bernard Flacelière, Chatenay Malabry, and Robert Cilesio, Clamart, both of France, assignors to Logabox, France

Filed Jul. 13, 1978, Ser. No. 924,333
Claims priority, application France, Jul. 13, 1977, 77 22170
Int. Cl.[2] B05C *17/06*
U.S. Cl. 101—227 **3 Claims**



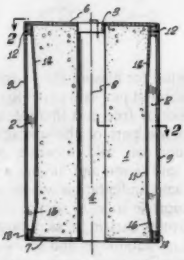
1. A device for insertion, drive and ejection of sheets of paper in a printer, comprising means defining plural automatic paper insertion paths and at least one manual insertion path for cards or sheets, said printer having an impression unit, said paths energing into a single paper feed path at an insertion point in the impression unit of the printer, said device further comprising means, arranged on each of the automatic insertion paths, for effecting the insertion of a continuous band of paper up to a predetermined cutting point common to each automatic insertion path, and located above the said insertion point and means for cutting the band when a predetermined length has been engaged below the said cutting point, on its arrival at the said cutting point, the automatic insertion paths having a common portion from a meeting point situated above the said predetermined cutting point and each automatic insertion path including a first pair of declutchable driving rollers placed above the said meeting point; a second pair of permanently engaged driving rollers being placed below the said cutting point; the device further comprising means for detecting the arrival of the paper on each automatic insertion path, above the said meeting point; means for effecting manual control of the simultaneous engagement of the first pairs of rollers during a controllable interval; means, actuated by the said detecting means, for inhibiting the said manual control and for automatically controlling the simultaneous engagement of the first pairs or rollers so that the bands of paper traverse simultaneously the portion of path included between the detecting means and the said cutting point, and means for selectively controlling the engagement of one of the first pairs of rollers after the said portion of path has been traversed, so as to advance the paper to the second pair of drive rollers.

4,216,720

ROD-FRAGMENT CONTROLLED-MOTION WARHEAD (U)

Marvin L. Kempton, Socorro, N. Mex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1974, Ser. No. 475,486
Int. Cl.[3] F42B *13/48*
U.S. Cl. 102—67 **7 Claims**



1. A rod-fragment controlled-motion warhead comprising:
a series of discrete elongate rod-like fragments disposed laterally-adjacent one to the other for forming a side-by-side row,
an explosive charge disposed interiorally of and closely adjacent to said row substantially co-extensive with said elongate fragments,
structural means maintaining said row and charge in said adjacent relationship, and
means for detonating said charge for forcefully driving said fragments at a high velocity outwardly from the longitudinal axis of said warhead,
said fragments of said row each being disposed at a substantially identical inclination from said warhead axis whereby said fragments propeller equally in the same rotational direction during their outward travel eventually to line-up end-to-end at a particular radius;
said explosive charge and the mass of said fragments being relatively arranged to provide a substantially uniform velocity ratio throughout the entire length of each fragment whereby tumbling action is minimized.

4,216,721

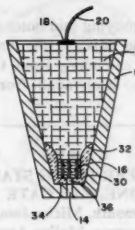
THERMITE PENETRATOR DEVICE (U)

Samuel J. Marziano, Glenolden, and Reed E. Donnard, Huntingdon Valley, both of Pa., assignors to The United Stated of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1972, Ser. No. 316,602
Int. Cl.[3] F42B *11/24*
U.S. Cl. 102—90 **5 Claims**

1. In a thermite penetrator device for destroying a metal target comprising a refractroy crucible containing a thermite mixture therewithin, said crucible having a plurality of metal discs disposed adjacent a bottom portion of said mixture and

crucible, said discs providng a space therearound between said discs and crucible, said discs being devoid of any chemical reaction with said thermite mixture, a readily ignitable starter material atop said thermite mixture, an igniter cord contacting said starter material and an exit hole in said crucible below said discs for passing molten thermite reaction products therethrough, said products comprising molten metal and molten oxide, the improvement therewith comprising



a refractory protector piece disposed within said space between said discs and said crucible and surrounding all peripheral portions of said discs and in contacting relation with all of said peripheral portions, the upper portions of said refractory protector piece being in direct contact with said thermite mixture, such that said molten thermite reaction products must melt and pass vertically through each of said discs whereby heavier molten metal will pass through said exit hole to penetrate said target prior to said molten oxide.

4,216,722

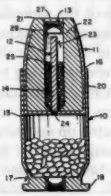
EXPLODING BULLET

Howard N. Angell, N. 6809 Lincoln St., Spokane, Wash. 99208

Filed Jun. 5, 1978, Ser. No. 912,494

Int. Cl.[3] F42B *11/10*

U.S. Cl. 102—91 **5 Claims**



1. An explosive bullet for small arms ammunition comprising, in combination:

a bullet having a core encased in a thinner jacket defining circularly cylindrical sidewalls to engage the bore of a gun barrel, a relatively flat base and a tip; and defining

an explosive chamber extending from the tip through the core and into the relatively flat base of the jacket, the explosive chamber having a circularly cylindrical configuration and a forwardmost portion configured to receive and be covered by a detonator;

an explosive carried in the explosive chamber; and

a detonator carried in the forwardmost part of the explosive chamber.

4,216,723

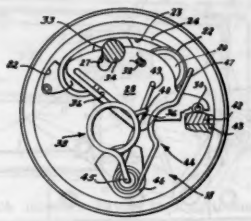
BOMBLET FUZE

Leo V. Giladett, Santa Cruz, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 538,840, Jan. 8, 1975, abandoned. This application May 31, 1977, Ser. No. 801,715

Int. Cl.[2] F42C *5/00*

U.S. Cl. 102—223 **8 Claims**



1. A fuze for use with a bomblet comprising a housing, an arming mechanism located within said housing, a firing mechanism located within said housing adjacent said arming mechanism, said arming mechanism being made up of a detonator moveable in only one plane, first means operatively associated with said detonator for preventing movement thereof when in a preselected position within said housing, said first movement prevention means being in the form of a plate pivotally mounted in said housing, said plate having an outstanding element thereon for engaging said detonator, second means operatively associated with said detonator for preventing movement thereof when in a preselected position within said housing, means having no pre-load thereon operatively connected to said detonator and capable of moving said detonator when in a loaded condition, means operatively connected to said detonator moving means for loading said detonator moving means, means operatively connected to said first means for removing said first means from its preselected position and means operatively connected to said second means for removing said second means from its preselected position, whereby upon the removal of said first and second means from said positions, said detonator moving means moves said detonator into a position in operable alignment with said firing mechanism thereby permitting the subsequent detonation of said fuze to take place.

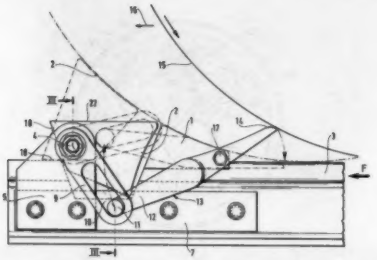
2. A fuze for use with a bomblet comprisig a housing, an arming mechanism located within said housing, a firing mechanism located within said housing adjacent said arming mechanism, said arming mechanism being made up of a moveable detonator, first means operatively associated with said detonator for preventing movement thereof when in a preselected position within said housing, said first movement prevention means being in the form of a plate pivotally mounted in said housing, said plate having an outstanding element thereon for engaging said detonator and a cam slot therein, second means operatively associated with said detonator for preventing movement thereof when in a preselected position within said housing, means having no pre-load thereon operatively connected to said detonator and capable of moving said detonator when in a loaded condition, means operatively connected to said detonator moving means for loading said detonator moving means, said loading means being operatively connected to said slot within said plate, means operatively connected to said first means for removing said first means from its preselected position and means operatively connected to said second means for removing said second means from its preselected position, whereby upon the removal of said first and second means from said positions, said detonator moving means moves said detonator into a position in operable alignment with said firing mechanism thereby permitting the subsequent detonation of said fuze to take place.

4,216,724

STOP DEVICE FOR STOPPING A WHEELED VEHICLE

Charles Grillet, Asnieres, France, assignor to CGEE Alsthom, Levallois Perret, France

Filed Oct. 13, 1978, Ser. No. 951,204
Claims priority, application France, Oct. 28, 1977, 77 32637
Int. Cl.[2] B61K *7/20*
U.S. Cl. 104—258 3 Claims



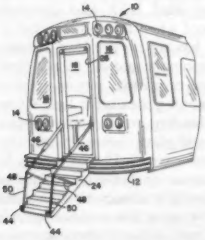
1. A stop device for stopping a wheeled vehicle which runs on a guide rail, said device comprising a scotch block mounted to the rail, for striking by the leading wheel of the vehicle to block passage of said vehicle, said scotch block in this position fitting a part of the outer circumference of said wheel at a certain height, the improvement wherein said scotch block is formed by a lower part and an upper part, said lower part being fixedly mounted to said rail, said upper part being mounted to said lower part for rotation about an axis and being retractable from a high position to a low position and vice-versa by rotation about said axis, and control means for effecting movement from the low position to the high position, said control means comprising an operating component situated upstream from and immediately adjacent the lower part of the scotch block, said operating component comprising a lever pivoted to said lower part and including a first free arm at one end positioned in the path of said wheel and a second arm articulated to the upper part of said scotch block for pivoting said upper part about said axis such that said operating component being in the path of movement of said front wheel is actuated upon contact of said first free arm by said front wheel of the vehicle.

4,216,725

COMBINATION DOOR AND EMERGENCY STAIRWAY EXIT

Keith J. Hallam, Merrillville, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Nov. 13, 1978, Ser. No. 960,428
Int. Cl.[2] B61D *19/00, 23/02*
U.S. Cl. 105—348 10 Claims



1. A combination end door and emergency stairway unit for passengers on a railway vehicle, the improvement comprising:

a door frame surrounding a door opening;

a modular door unit;

said modular door unit having an inner door frame;

hinge means for movement of the inner door frame from a position into and from said door opening;

auxiliary door means attached to the inner door frame and having means for hinged movement into and from said inner door frame;

an outer closure member mounted on said inner door frame; and

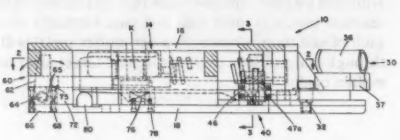
means for pivotally moving said outer closure member from an upright position adjacent the inner door frame to an inclined position extending from the door opening to allow passengers to safely alight from the passenger vehicle.

4,216,726

RAILWAY TRAILER HITCH STAND PIVOTING ONE-WAY GATE

Patricia S. Stoller, Plymouth, Mich.; James C. Hammonds, St. Charles; John O. Kloepper, Moline Acres, and Arnold Schlobohm, Ballwin, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Division of Ser. No. 844,665, Oct. 25, 1977. This application Mar. 2, 1979, Ser. No. 16,768
Int. Cl.[2] B60P *7/00;* B61D *3/16, 45/00;* B62D *53/10*
U.S. Cl. 410—64 5 Claims



1. A one-way gate assembly for a railway trailer hitch comprising: a trailer hitch having a pair of movable jaws adapted to assume a first position engaging and holding in place the kingpin of a piggyback trailer; jaw resilient means biasing said jaws toward an open position; yoke resilient means biasing a yoke into a first position engaging said jaws to maintain said jaws in said first position; a one-way gate located on the exit side of said jaws; said one-way gate being pivotably mounted about a horizontal axis; in one position said gate extending vertically upwardly, blocking exit of a trailer kingpin; resilient means biasing said gate to pivot the same outwardly and away from said jaws; first stop means engaging the base of said gate, maintaining said gate in said vertically extending position and preventing said gate from pivoting to open position; said first stop means being movable longitudinally of said hitch away from said gate to allow said gate to pivot to open position; second stop means located on said hitch located inboard of said gate which said gate engages after pivoting outwardly about said horizontal axis to hold said gate in open position.

4,216,727

PORTABLE TURNTABLE FOR MICROWAVE OVEN

Emmett M. Cunningham, Alexandria, Va., assignor to Plastics, Inc., St. Paul, Minn.

Filed May 22, 1978, Ser. No. 908,087
Int. Cl.[2] A47B *11/00, 85/00*
U.S. Cl. 108—20 10 Claims

1. A portable self-contained turntable for rotating foodstuffs in a microwave oven cavity comprising:

a base formed from a low dielectric loss material;

a table for receiving foodstuffs, said table being formed from a low dielectric loss material and said table being rotatably mounted on said base; and

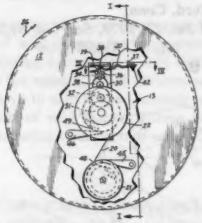
drive means mounted on said base for rotatably driving said

table from within the oven cavity, said drive means comprising:

a constant force spring;

a spring storage reel, said constant force spring being wound on said storage wheel;

an output reel secured to said table and centered on the axis of rotation of said table; and



an escapement mechanism connected to said output reel, said escapement comprising:

a gear step-up transmission;

a rotatable star wheel, said transmission interconnecting said output reel and said star wheel; and

a pendulum actuated by rotation of said star wheel.

4,216,728

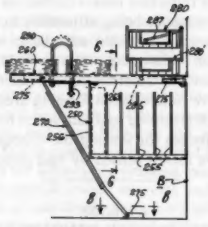
DOCUMENT STORAGE DEVICES FOR SERVICE TRUCK

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Division of Ser. No. 632,625, Nov. 17, 1975, Pat. No. 4,056,194, which is a division of Ser. No. 418,835, Nov. 26, 1973, Pat. No. 3,957,159, which is a division of Ser. No. 240,163, Mar. 31, 1972, Pat. No. 3,807,788. This application Aug. 15, 1977, Ser. No. 824,640

Int. Cl.³ A47B *41/04, 23/00*

U.S. Cl. 108—44 **3 Claims**



1. In combination with a vehicle having a forward driver's compartment with a driver's seat on one side thereof, a rear compartment, and a bulkhead behind the driver's seat separating said compartments, document supporting means adjacent the driver's seat comprising

(a) a table for supporting documentary material, said table having a free outer end and an inner end disposed adjacent said bulkhead, said table including a pair of lateral flanges on opposite sides thereof,

(b) means for attaching said inner end of the table to said bulkhead comprising a sping latch affixed to the outer end of each flange for ready engagement with a cooperating fixed element on said bulkhead, and

(c) a rearwardly directed diagonal strut having its upper end detachably connected to the underside of said table at the forward portion thereof remote from the bulkhead, and the lower end thereof detachably connected to the floor of said compartment.

4,216,729

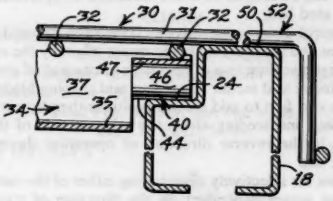
DECK CHANNEL FOR STORAGE RACK BEAM

Donald E. Schrader, Nashville, Tenn., assignor to Nashville Wire Products Manufacturing Co., Inc., Nashville, Tenn.

Filed Feb. 8, 1979, Ser. No. 10,242

Int. Cl.³ A47B *3/06*; A47F *5/14*

U.S. Cl. 108—159 **8 Claims**



1. In a deck member having a longitudinal dimension adapted to span a pair of longitudinally spaced transverse support beams, each beam having a ledge, a support member comprising:

(a) an elongated channel of predetermined depth including opposed side walls having top edges and a bottom web, and having opposite end portions,

(b) each end portion comprising side wall portions constituting longitudinal extensions of said side walls, but of lesser depth than said side walls and having lower edge portions,

(c) each end portion further comprising a web portion connecting said lower edge portions and having a bearing surface above said bottom web adapted to bear upon a ledge of a support beam, so that said support member can support the deck member on the transverse support beams, and

(d) said web portion comprising an elongated center flange member projecting upward from said bearing surface between said side wall portions.

4,216,730

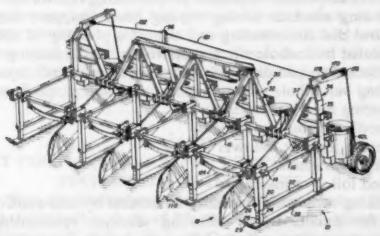
SIDE HILL BED SHAPER AND PLANTER

Billy M. Noble, P.O. Box 557, 100 Sunset Dr., Somerton, Ariz. 85350

Filed Mar. 27, 1978, Ser. No. 890,208

Int. Cl.² A01C *5/06*

U.S. Cl. 111—69 **7 Claims**



1. A planter for planting agricultural crops in two-way operation along one side of raised generally parallel seed beds comprising:

(a) a frame including a tool bar supported on ground-engaging means for traversing a field along said seed beds;

(b) mounting means on said frame having at least a first and second operating position;

(c) multiple seeder means tiltably secured to said mounting means including a receptacle for seeds and dispensing means for dispensing the seeds at a preselected rate, said

dispensing means being driven from ground engaging drive means;

(d) shaping blade means pivotally mounted on said frame about a vertical pivot axis intermediate adjacent seeder means positioned to precede said seeder means, the number of shaping blade means being one less than the number of seeder means, said shaping blade means having at least a first and second position whereby a selected seed bed side can be shaped in either direction of operation along said seed bed;

(e) control means operatively connected to said seeder means and said shaping blade means whereby the operator can reverse direction of operation at one end of a seed bed and move said seeder means and said shaping blade means from said first to said second positions thereby permitting shaping and seeding along the selected side of the seed beds in the reverse direction of operation through the field; and

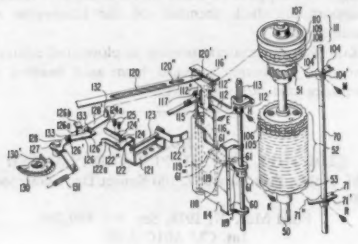
(f) means for selectively disengaging either of the outermost seeder means dependent on the direction of travel and whereby upon a reversal of direction of travel the shaping blade means preceding the inoperative seeder means is moved to either of said positions to cooperate with the seeder means immdiately adjacent the inoperative seeder means.

4,216,731

AUTOMATIC BUTTONHOLE STITCH PROPORTIONING DEVICE FOR SEWING MACHINES

Fumihiko Yazawa, Utsunomiya, Japan, assignor to The Singer Company, Stamford, Conn.

Filed Nov. 2, 1978, Ser. No. 956,937
Int. Cl.[2] D05B *3/02, 3/04, 3/06*
U.S. Cl. 112—158 B **5 Claims**



1. An automatic buttonhole proportioning control device for a sewing machine having zig-zag needle support means, a control dial for selecting any one of a plurality of different indicated buttonhole stitch proportions, and indicating means connected to said dial and controlled thereby and capable of sewing buttonhole pattern having said stitch proportions, said actuating means comprising:

needle jogging cam means;

needle jogging follower means;

feed cam means;

feed follower means;

linking means mechanically influenced by said control dial for simultaneously effecting selective relationship between said needle jogging cam means and said needle jogging follower means and between said feed cam means and said feed follower means to produce, in sequence, a first bar stitching, a first set of side stitching, a second bar stitching, and a second side stitching, each of said stitchings for a given buttonhole pattern have predetermined proportional widths; and

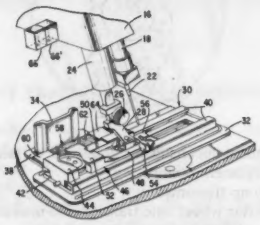
a stitch width regulating device comprising proportioning means connecting said needle jogging follower means to said needle support means and connected to said control dial to be controlled thereby to control, automatically, the bar stitching width and side stitching width suitably proportioned according to different sized ones of said various buttonhole patterns.

4,216,732

OPTICAL SWITCHING DESIGN FOR ONE STEP BUTTONHOLING

Walter H. Marsh, Fanwood; Howard L. Beckerman, Red Bank, and Allan M. Dob, Clifton, all of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 23, 1979, Ser. No. 59,865
Int. Cl.[2] D05B *3/06*
U.S. Cl. 112—158 B **6 Claims**



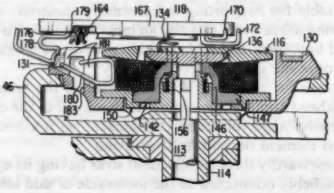
1. An optical buttonhole mechanism for a zig zag sewing machine having a work supporting surface with a stitch forming area contained thereon, a sewing head overhanging said work supporting surface, a needle bar carrying a needle in endwise reciprocatory motion toward and away from said stitch forming area, a presser bar journalled in said sewing head and extending toward said work supporting surface, said presser bar having fastened thereto a buttonhole foot for containing a garment being sewn against the upward thrust of a feed dog rising from said work supporting surface, said buttonhole foot being moveable along a line of material feed toward and away from said stitch forming area by the fabric feeding movement of said feed dog and including adjustable means for retaining thereon a button, wherein the improvement comprises an adjustable reflective means carried on said buttonhole foot, said reflective means being adjustable in response to the size of button contained by said adjustable button retaining means, photosensor means responsive to light reflected from said reflective means for determining the position of said buttonhole foot relative to said stitch forming area on said bed, as said buttonhole foot is moved past said stitch forming area, and electronic circuit means for sensing the change in reflectance from said reflective means sensed by said photosensor means.

4,216,733

AUTOMATIC BOBBIN WINDING SYSTEM

Boleslaw Kornatowski, Elizabeth, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 8, 1979, Ser. No. 2,044
Int. Cl.[2] D05B *57/08, 59/00*
U.S. Cl. 112—184 **4 Claims**



1. A lockstitch sewing machine comprising an endwise reciprocating needle bar;

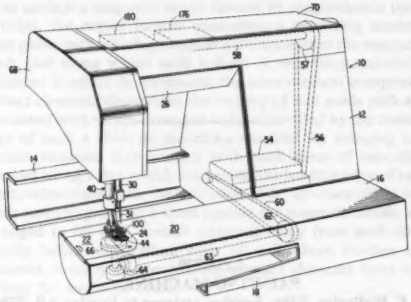
a sewing needle affixed to the end of said needle bar;
a work feeding system for urging a work material in a selected direction at a selected rate;
a looptaker for cooperation with said sewing needle in the formation of stitches;
a bobbin supported within said looptaker;
means for filling said bobbin with thread while supported within said looptaker;
a first means for sensing depletion of thread from said bobbin;
means responsive to said first sensing means for terminating operation of said work feeding system while simultaneously initiating operation of said bobbin filling means;
second means for sensing a full bobbin; and,
means responsive to said second sensing means for terminating operation of said bobbin filling means and simultaneously reinitiating operation of said work feeding system.

4,216,734

SEWING MACHINE WITH UNIVERSAL UPPER FEED

Peter J. Totino, N. Bergen, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Mar. 26, 1979, Ser. No. 24,226
Int. Cl.[2] D05B *27/04*
U.S. Cl. 112—320 **6 Claims**



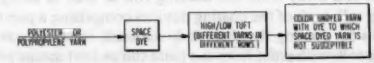
1. In a sewing machine having a frame, a needle bar supported for endwise reciprocation within said frame, a drive means for selectively imparting endwise reciprocation to said needle bar, an upper feeding system comprising: a presser strut supported by said frame for endwise motion, a feeding rod, a presser foot affixed to one end of said presser strut, a feeding foot affixed to one end of said feeding rod, means for supporting said feeding rod to enable motion of said feeding foot in any direction, means for alternately pressing said feeding foot and said presser foot against a work material, and means connected to the other end of said feeding rod from said feeding foot for shifting said feeding foot to any selected position within its range of motion.

4,216,735

MULTI-COLORED TUFTED CARPET AND METHOD OF PRODUCING SAME

Ollie F. McDaniel, Jr., Rome, Ga., assignor to WWG Industries, Inc., Rome, Ga.

Filed May 17, 1978, Ser. No. 906,475
Int. Cl.[2] D05C *17/02*
U.S. Cl. 112—410 **10 Claims**


POLYESTER OR POLYPROPYLENE YARN
SPACE DYE
HIGH/LOW TUFT (DIFFERENT YARNS IN DIFFERENT ROWS)
COLOR UNDYED YARN WITH DYE TO WHICH SPACE DYED YARN IS NOT SUSCEPTIBLE

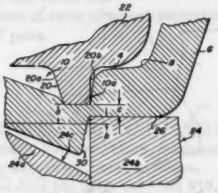
1. A method of making a multi-colored patterned carpet which consists essentially of space dyeing a yarn selected from the group consisting of polyester and polypropylene yarns, tufting said space dyed yarn and an undyed yarn having a susceptibility to a dye to which the space dyed yarn is non susceptible in alternating rows by a high/low technique to form a carpet having a high/low design thereon, and thereafter dyeing said undyed yarn with a dye to which the space dyed yarn is not susceptible.

4,216,736

METHOD AND APPARATUS FOR FORMING NO-FIN SCORED METAL ENDS

Teddy M. Westphal, Glenco, Mo., assignor to Boise Cascade Corporation, Boise, Id.

Filed Feb. 2, 1979, Ser. No. 9,188
Int. Cl.[3] B21D *51/44*
U.S. Cl. 113—121 C **15 Claims**



1. The method of forming a scoreline in the horizontal generally disk-shaped central panel portion of a metal end closure member having an upwardly extending annular chuckwall portion connected at its lower end with the peripheral edge of the central panel portion by a curved radius portion, which comprises the steps of:
(a) forming in the one horizontal surface of the central panel member a continuous scoreline having in transverse cross-section a generally trapezoidal configuration including a horizontal generally flat bottom wall, and a pair of generally divergent side walls, said scoreline having a configuration for defining in said central panel portion a removable panel section; and
(b) simultaneously forming in the other horizontal surface of said central panel portion a vertically offset horizontal relieved surface extending from a location opposite the juncture between one scoreline side wall and the scoreline bottom wall in a radial direction away from the scoreline, whereby the distance (a) between the scoreline bottom wall and the plane containing said other horizontal surface is greater than the distance (c) between said scoreline bottom wall and said horizontal relieved surface, so that upon progressive removal of said removable panel section from said central panel portion, the formation of sharp metal fins or projections on the residual portion of the metal end is avoided.

4,216,737

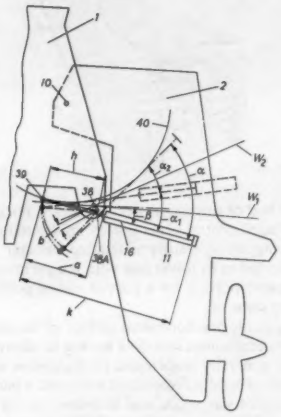
LIFT CONTROL DEVICE FOR PROPELLER DRIVE SYSTEMS ON WATERCRAFTS

Heinz Niederste-Hollenberg, Gauting; Christoph Sacher; Friedrich Fickenscher, both of Munich, and Johann Eichinger, Putzbrunn, all of Fed. Rep. of Germany, assignors to Carl Hurth Maschinen- und Zahnradfabrik, Munich, Fed. Rep. of Germany

Division of Ser. No. 778,151, Mar. 16, 1977, Pat. No. 4,137,862.
This application Jan. 29, 1979, Ser. No. 7,212
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1976, 2612564; Nov. 6, 1976, 2650879
The portion of the term of this patent subsequent to Feb. 6, 1994, has been disclaimed.
Int. Cl.[2] B63H *5/12*
U.S. Cl. 440—61 **2 Claims**

1. In a lifting device for use with a Z-drive arrangement for

watercrafts having a drive motor and a propeller and a transmission shaft arrangement which extends from said drive motor below the water level to said propeller, said transmission shaft arrangement being positioned in a housing mounted for a pivotal movement relative to said watercraft about a substantially horizontal axis and at least one power lift cylinder for effecting a driven movement of said housing about said horizontal axis, the improvement comprising wherein said lift cylinder is fixedly secured to said housing for movement therewith and against movement with respect thereto, said lift cylinder having a piston reciprocally mounted therein and a piston rod secured at one end to said piston, said lift cylinder having a rod guideway at the point where said piston rod exits therefrom, and a steering knuckle arm connecting the other end of said piston rod to said watercraft, said steering knuckle arm being pivotally secured to said watercraft about a first pivot axis, said other end of said piston rod being pivotally secured to



said steering knuckle arm about a second pivot axis, and compensating means for facilitating a change in the location of said second pivot axis relative to said watercraft as said housing pivots about said horizontal axis, said compensation means including means on said steering knuckle arm spacing said second pivot axis from said first pivot axis, said first and second pivot axes being parallel to each other, wherein the angle of movement (α) through which said housing traverses comprises two angles, a first angle (α_1) corresponding to the maximum trim angle through which said housing is moved for trim adjustment and a second angle (α_2) corresponding to the angle through which said housing is moved between said maximum trim angle and the maximum angle of movement of said housing, wherein said first and second angles each have an angle bisector which intersects with the other, and wherein said first pivot axis is spaced from the point of intersection of said angle bisectors toward said piston rod at the end of the pivoting range.

4,216,738

METHOD OF RENEWING WATER PIPE, INCLUDING COATING THEREOF, AND APPARATUS THEREFOR

Natsuo Muta, Fukuoka, Japan, assignor to Kabushiki Kaisha Kankyo Kaihatsu, Fukuoka, Japan

Filed Nov. 6, 1978, Ser. No. 957,860

Claims priority, application Japan, Dec. 21, 1977, 52-154882

Int. Cl.[2] **B05D** *7/22;* **B05C** *11/00;* **B05B** *13/06;* **B05C** *5/00*

U.S. Cl. 118—72 **13 Claims**

1. An apparatus for coating the inner surface of a pipe comprising:

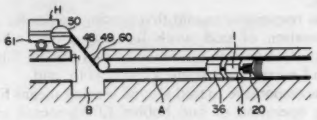
(a) a casing;

(b) an air driven motor arranged within said casing;

(c) an air passage formed in said casing for introducing air into said casing to drive said motor;

(d) a cowling shaft projecting from a first end of said casing, said shaft being adapted to be rotated by said motor;

(e) a cap-shaped cowling having a base wall and a peripheral wall, said peripheral wall comprising a plurality of apertures, said cowling being attached to said cowling shaft to rotate with said shaft;



(f) a paint passage, having an inlet and outlet, extending the length of said casing, said outlet opening onto said first end of said casing; and

(g) a paint nozzle connected to said end of said paint passage opening onto said first end of said casing to receive paint passing therethrough, said paint nozzle comprising at least one nozzle orifice facing and spaced from the interior of said peripheral wall of said cowling.

4,216,739

PAINTING MACHINE

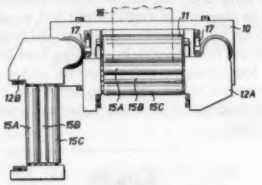
Jan F. Wallenius, Täby, Sweden, assignor to Ventive AB, Täby, Sweden

Filed Nov. 25, 1977, Ser. No. 854,786

Claims priority, application Sweden, Nov. 26, 1976, 7613256

Int. Cl.[2] **B05C** *1/08*

U.S. Cl. 118—216 **16 Claims**



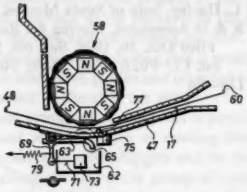
1. A machine for painting sheet strip material comprising (a) a backing roll for the sheet strip material, (b) two paint-coating devices arranged beside each other on a common supporting member which extends in parallel to the backing roll, and further comprising a parallelogram-type guiding mechanism by means of which the supporting member is displaceable towards and away from the backing roll as well as along the backing roll, each of the coating devices comprising a paint tub and rolls for coating the sheet strip material, running over the backing roll, with paint from the paint tub and (c) means pivotally mounting said paint-coating devices for positioning each alternatingly in an operative position in which it co-operates with the backing roll and a non-operative position in which it is displaced from the path of the sheet-strip material.

4,216,740

DEVELOPING DEVICE FOR DEVELOPING ELECTROSTATIC IMAGES WITH A MAGNETIC BRUSH

Karlheinz Achenbach, Kaufbeuren, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Jun. 9, 1978, Ser. No. 914,151
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726209
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—681 9 Claims



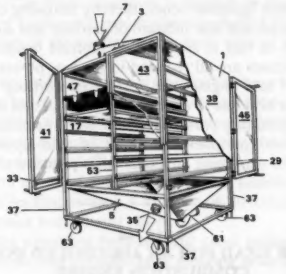
1. In a device for developing electrostatic charge images produced on the surface of a sheet of electrophotographic recording material in a copier which employs a magnet having on its surface a magnetic brush formed of magnetizable toner particles, the copier further presenting a recording material sheet guide path which extends at a distance from the magnetic brush, and along which such a sheet of recording material is advanced to effect development, the improvement comprising contact elements disposed in the vicinity of said guide path and associated with means arranged to be controlled by the leading edge of such a sheet of recording material for bringing said contact elements into contact with such sheet of recording material along a line which lies behind the leading edge of such sheet, when viewed in the direction of its advance along said guide path, to press such sheet against the magnetic brush, and arranged to lift said contact elements away from such sheet shortly before the trailing edge of such sheet reaches said elements, thereby to prevent said contact elements from contacting the magnetic brush.

4,216,741

EXPOSURE CHAMBER

Owen R. Moss, Kennewick, Wash., assignor to Hazleton Systems, Inc., Aberdeen, Md.

Filed Mar. 5, 1979, Ser. No. 17,519
Int. Cl.[2] A01K *1/03*
U.S. Cl. 119—15 13 Claims



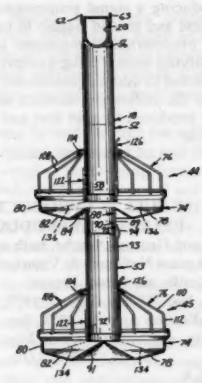
1. An exposure chamber comprising
(a) imperforate substantially vertical front, rear and side walls and closed upper and lower ends;
(b) a gas inlet in one of said ends;
(c) a gas outlet in the other of said ends;
(d) an inlet deflector adjacent said inlet constructed and arranged to deflect gas introduced at said inlet toward said substantially vertical walls;
(e) a plurality of imperforate, substantially horizontal pans within said chamber, each of said pans, other than that most remote from said inlet, being spaced from said vertical walls by distances which are sufficient to permit flow of air along said walls sufficient to supply sufficient gas to pans downstream of it but which are small compared to the horizontal dimensions of the pans, said pans being arranged in horizontally positioned pairs, the pans of each pair being horizontally spaced from each other a distance which is sufficient to exhaust gas from said pans and the pans upstream of them but which is small compared to the horizontal dimensions of said pans;
(f) means constructed and arranged to prevent substantial flow of air between said vertical walls and the pan most remote from said inlet; and
(g) support means of open structure supported above at least some of said pans.

4,216,742

MULTI-TIERED CAGE AND FEED DEVICE

James E. Kirchhofer, Luverne, Minn., assignor to A. R. Wood Manufacturing Company, Luverne, Minn.

Filed Jun. 15, 1978, Ser. No. 910,684
Int. Cl.[2] A10K *39/00*
U.S. Cl. 119—18 22 Claims



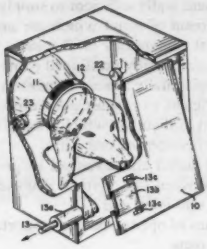
1. A multi-tiered feed device for animals, comprising:
an upper first animal feed station;
a lower second animal feed station spaced generally vertically from said first station, each of said stations including a pan having a bottom and a sidewall extending upwardly from said bottom, and a top enclosure secured to said sidewall and being configured for access of the animals to the interior of the pan;
means for supplying feed to said feed stations, including a first discrete feed conduit having a feed inlet and a feed outlet extending into said first station and being positioned over and above an aperture in said bottom of said pan of said first station, said first station being mounted on said first conduit, and a second discrete feed conduit having a feed inlet positioned beneath said aperture and a feed outlet extending into said second station and above said bottom of said pan of said second station, said second station being mounted on said second conduit; and
first suspension means for suspending said first station from said first conduit and second suspension means for suspending said second conduit from said first station.

4,216,743

MAGNETICALLY UNLOCKED PET DOOR

Robert E. Cohen, 759 Harrison St., San Francisco, Calif. 94131

Filed May 30, 1978, Ser. No. 910,093
Int. Cl.[2] E05B *65/00*
U.S. Cl. 119—19 **6 Claims**



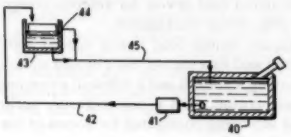
1. In a door hinged at the top for permitting ingress and egrees of a pet, an electromagnetically controlled latch for preventing the door to swing open in the egress direction, and a magnetically controlled circuit for energizing said latch in response to a magnetic field of a permanent magnet carried on the body of said pet, said circuit being comprised of first and second magneto diodes for producing respective first and second current signals proportional to the magnetic flux present at the positions of said magnetodiodes, said magnetodiodes being positioned on opposite sides of said door, and amplifying means for producing a signal proportional to the difference between said first and second signals to energize said latch in response to a predetermined minimum change in magnetic flux, said amplifying means being comprised of a differential amplifier connected to said magnetodiodes to produce a signal proportional to the difference between said first and second current signals produced by said first and second magnetodiodes.

4,216,744

ENGINE WHOSE FUEL IS A PRODUCT OTHER THAN A PETROLEUM PRODUCT

Roger Oswald, and Georges Agache, both of Le Havre, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Division of Ser. No. 775,039, Mar. 7, 1977, Pat. No. 4,123,997.
This application Aug. 24, 1978, Ser. No. 936,639
Claims priority, application France, Mar. 8, 1976, 76 06510
Int. Cl.[3] F02M *5/10*
U.S. Cl. 123—1 A **6 Claims**



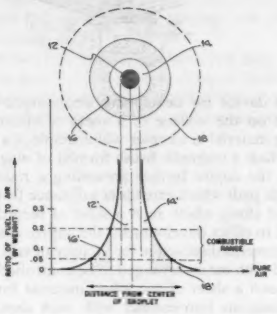
1. A fuel feed circuit for an internal combustion engine utilizing a carburettor adapted to receive as fuel a mixture in variable proportions of a conventional petroleum product and another product, preferably an alcohol based product, comprising a tank adapted to hold the fuel, pump means for delivering the fuel through first conduit means from said tank to said carburettor at a flow rate greater than the fuel consumption of the engine at full load, said carburettor including a fuel receiving float chamber, first means for returning fuel from said float chamber to said tank through second conduit means without flowing through said first conduit means during normal operations, said pump means, tank and the first and second conduit means defining a closed loop fluid circuit whereby fuel is continuously circulated through the tank, carburettor and the first and second conduit means during normal operations whereby local heating and separation of the fuel into its individual products is precluded, and second means for draining said float chamber into said second conduit means upon the deactivation of said pump means thereby preventing percolation of the alcohol based product.

4,216,745

UNTHROTTLED LEAN MIXTURE GASOLINE ENGINE

Albert L. Latter, Marina del Rey; R. Philip Hammond, and James L. Dooley, both of Santa Monica, all of Calif., assignors to R & D Associates, Marina del Rey, Calif.

Filed Oct. 10, 1978, Ser. No. 949,764
Int. Cl.[2] F02B *3/02, 23/10*; F02F *1/24*
U.S. Cl. 123—26 **6 Claims**



1. An automotive engine of the internal combustion type having respective pistons and cylinders wherein the improvements include:

means for supplying air to the pistons at a pressure at least equal to atmospheric pressure throughout the power operating range of said engine;

means for providing a ratio of less than 1:20 of gasoline to air in the low power operating range of said engine;

means for supplying droplets of gasoline substantially uniformly distributed throughout selected defined regions of the volume of each of the combustion chambers of said engine, whereby despite an overall sub-ignition ratio of gasoline to air, small local ignitable zones surround each of said droplets; and

means for providing a vigorous spark extending through a predetermined volume in said cylinder to ignite at least one of said ignitable zones, thereby initiating combustion throughout said lean mixture of gasoline and air; whereby the ratio of fuel to air and the resultant temperature and energy losses are all reduced in the low power operating range of said engine; and further comprising means for reducing heat loss to the cylinder walls of said engine, said means including porous cylinder walls extending around the curved peripheral surfaces of said cylinders, and means for supplying air under high pressure to the outer surface of said porous walls.

4,216,746

CYLINDER HEAD FOR AN AIR-COOLED INTERNAL COMBUSTION ENGINE

Fritz Freyn, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Jun. 1, 1978, Ser. No. 911,535
Claims priority, application Austria, Jun. 7, 1977, 4032/77
Int. Cl.[2] F02S *1/32*
U.S. Cl. 123—41.69 **5 Claims**

1. In a cylinder head for an air-cooled internal combustion engine which comprises:

an intake duct and an exhaust duct, each said duct being positioned to extend transversely to the direction of cooling air flow around said cylinder head,

valve guides,

groups of cooling fins oriented both parallel with the cylinder axis in said cylinder head and perpendicularly with respect thereto,

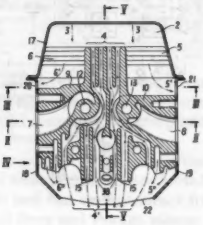
lateral and top air-leading surfaces,

the improvement wherein:

a first group of said groups of cooling fins is positioned in a region below said intake and exhaust ducts are oriented so as to extend perpendicularly with respect to the cylinder axis and from the frontside to the backside of the cylinder head, as seen in the direction of cooling air flow,

a second group of said groups of cooling fins is positioned in a region between said valve guides and oriented to extend parallel with respect to the cylinder axis,

a third group of said groups of cooling fins is positioned on both sides of said second group of cooling fins in the region of said intake and exhaust ducts and on the side of the afflux of cooling air, said third group of cooling fins extending perpendicularly to the cylinder axis and also extending to the walls of the intake and exhaust ducts, respectively,



a fourth group of said groups of cooling fins is positioned at the exit of the cooling air and to extend parallel with respect to the cylinder axis,

said lateral air-leading surfaces is located on the side of the afflux of cooling air, said surfaces including lateral outlets for a part of the cooling air on both sides of the cylinder head,

said top air leading surface is positioned above the cylinder head in spaced relation to the topmost portions of the fins in said third group of cooling fins so as to form an air duct in front of said intake and exhaust ducts, seen in the direction of cooling air flow,

said fourth group of cooling fins forming together with said top air-leading surface a number of air conduits behind said intake and exhaust ducts,

an air duct extending between said valve guides and above said intake and exhaust ducts merging with said air conduits,

said top air-leading surface having in the region of said air conduits no more than a small distance between it and said fourth group of cooling fins, and

said lateral air-leading surfaces extending to the backside of the cylinder head where they form an outlet for cooling air.

4,216,747

UNIFLOW, DOUBLE-OPPOSED PISTON TYPE TWO-CYCLE INTERNAL COMBUSTION ENGINE

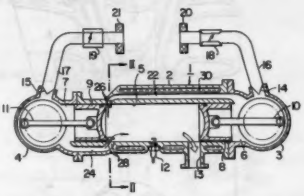
Masaaki Noguchi, Nagoya; Yukiyasu Tanaka, Okazaki; Taro Tanaka, and Norikatsu Uejima, both of Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 5, 1978, Ser. No. 939,774

Claims priority, application Japan, Sep. 7, 1977, 52-107383; Sep. 16, 1977, 52-111978

Int. Cl.[2] F02B *25/10*

U.S. Cl. 123—51 BA **3 Claims**



1. A uniflow, double-opposed piston type two-cycle internal combustion engine of the type comprising

a cylinder having a center portion in which an ignition plug is provided;

a pair of crankcases securely attached to the ends of said cylinder so to define a first crank chamber and a second crank chamber;

a pair of cranks disposed in said first and second crank chambers;

first and second pistons operatively connected to said cranks, respectively, and slidably fitted into said cylinder so as to move toward and away from each other with said first piston leading said second piston, both of said first and second pistons including a head having a partially spherical recess;

an exhaust port being formed through the wall of said cylinder so as to be opened and closed by said first piston; and

a plurality of scavenging ports being formed through the wall of said cylinder so as to be opened and closed by said second piston;

first means for feeding a rich air-fuel mixture into said cylinder through a predetermined number of said plurality of scavenging ports; and

second means for feeding a relatively leaner air-fuel mixture into said cylinder through the remaining ones of said plurality of scavenging ports;

said first feeding means and said second feeding means being so arranged that said remaining scavenging ports are opened earlier than said predetermined number of said scavenging ports;

wherein said predetermined number of said scavenging ports are arranged so that the rich mixture is directed toward the top surface of the head of said second piston when the latter is at the bottom dead center; and

said remaining scavenging ports are arranged so that the relatively leaner mixture is directed toward the center portion of said cylinder when said second piston is at the bottom dead center.

4,216,748

INTERNAL COMBUSTION ENGINE WITH SUBSIDIARY COMBUSTION CHAMBER

Katsumi Ichida, Komae, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,837

Claims priority, application Japan, May 16, 1978, 53-57170

Int. Cl.[3] F02N *13/06*

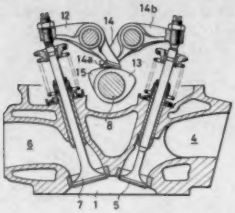
U.S. Cl. 123—253 **8 Claims**

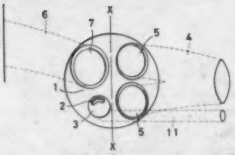
1. An internal combustion engine, comprising:

(a) a main combustion chamber located at an upper portion of the interior of one cylinder; and

(b) an auxiliary combustion chamber in communication with the main chamber through a torch passage,

in which the main combustion chamber further comprises, on one side of a vertical plane extending along on an axial line of a crankshaft and including the center of the





cylinder, two intake valves and an intake port connected thereto and, on the other side of the foregoing plane, a single exhaust valve and an exhaust port connected thereto and with the said auxiliary combustion chamber.

4,216,749

IGNITION TIMING CONTROL DEVICE

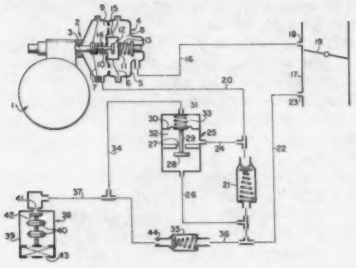
Tamotsu Ogita, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 3, 1979, Ser. No. 702

Claims priority, application Japan, Jan. 13, 1978, 53-2432

Int. Cl.[2] F02P *5/10*

U.S. Cl. 123—408 **5 Claims**



1. In an engine having an intake passage and a throttle valve provided in said intake passage, an ignition timing control device comprising:

a vacuum advancer having first and second diaphragm chambers and adapted to advance ignition timing when at least one of said diaphragm chambers is supplied with vacuum;

a first vacuum port which is positioned at the upstream side of the throttle valve when it is substantially closed so as to effect idling operation of the engine and which is positioned at the downstream side of the throttle valve when it is opened beyond a predetermined opening;

a second vacuum port constantly positioned at the downstream side of the throttle valve;

a first passage means which connects said first vacuum port and said first diaphragm chamber;

a second passage means which connects said second vacuum port and said second diaphragm chamber;

a check valve provided in said second passage means and adapted to allow fluid to flow only from said second diaphragm chamber toward said second vacuum port;

an ON/OFF valve provided in said second passage means in parallel with said check valve; and

a barometric control means which controls said ON/OFF valve opening said ON/OFF valve when atmospheric pressure is at or above a predetermined value and tending to close said ON/OFF valve when atmospheric pressure is below the predetermined value.

4,216,750

AIR-TO-FUEL RATIO CONTROL APPARATUS

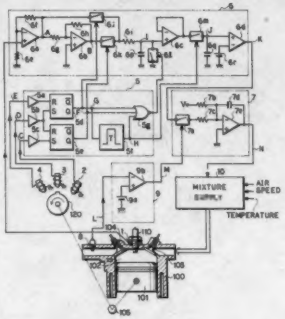
Akio Kobayashi, Kariya, Japan, assignor to Nippondenso Co., Ltd, Kariya, Japan

Filed Mar. 29, 1978, Ser. No. 891,381

Claims priority, application Japan, May 26, 1977, 52-61394

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—435 **4 Claims**



1. An air-to-fuel ratio control apparatus for a combustion engine which sequentially attains a compression stroke and a power stroke therein to rotate the output shaft thereof comprising:

mixture supply means responsive to the operating conditions of said combustion engine and effective to supply the cylinder of said combustion engine with a combustible mixture of air and fuel;

position detection means responsive to the rotation of said output shaft and effective to sequentially produce first, second and third position signals in synchronization with the rotation of said output shaft to respective first, second and third rotational positions, said second rotational position being predetermined to correspond to the transition from said compression stroke to said power stroke in said combustion engine, and said first and third rotational positions being predetermined to be spaced equally from said second rotational position such that said first and third position signals are produced during said compression and power strokes, respectively;

pressure detection means responsive to a pressure in said cylinder of said combustion engine and effective to produce a pressure signal changing in correspondence with the change of said pressure in said cylinder;

combustion monitor means responsive to said first, second and third signals and effective to compare a first portion of said pressure signal produced during a first time interval determined by said first and second position signals with a second portion of said pressure signal produced during a second time interval determined by said second and third position signals, said combustion monitor means produc-

ing a combustion monitor signal indicative of the presence or the absence of a complete combustion on said combustible mixture supplied to said cylinder; and

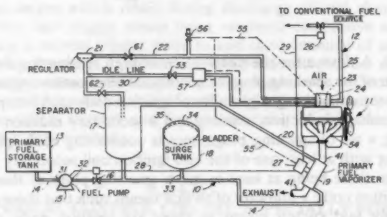
ratio modulation means responsive to said combustion monitor signal and effective to modulate said mixture supply means such that the air-to-fuel ratio of said combustible mixture is controlled to leaner and richer ratios in respective response to said combustion monitor signal indicative of the presence and the absence of said complete combustion in said cylinder.

4,216,751

PRE-VAPORIZING FUEL SYSTEM

Richard R. Davison, 303 Crescent, and William B. Harris, Rte. 3, Box 293 A, both of Bryan, Tex. 77801

Filed Apr. 26, 1976, Ser. No. 680,115
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—523 **20 Claims**



1. In combination with an engine having a conventional fuel supply system and being a spark ignited internal combustion engine an improved fuel system for use as a primary fuel source comprising;

(a) A fuel storage means for storing the primary fuel;

(b) A primary fuel transport means connected in fluid communication with said fuel storage means for transporting said primary fuel from said storage means;

(c) A heat source means:

(d) A primary fuel vaporizing means connected in fluid communication with said primary fuel transport means and connected in heat conductive communication with said heat source means for vaporizing said primary fuel and for controlling vaporization when vaporized primary fuel pressure is high by controlling the quantity of liquid primary fuel exposed to said heat source means by the pressure of said vaporized primary fuel forcing said liquid primary fuel out of heat conductive communication with said heat source means:

(e) A vapor regulator means in vapor communication with said primary fuel vaporizing means for supplying vaporized primary fuel in varying amounts in response to varying conditions of demand on said engine; and

(f) Means connected to said system for sensing the conditions in said system and switching said conventional fuel supply system off and said primary fuel source on when the conditions sensed in said primary fuel vaporizing means are sufficient for the use of said primary fuel.

4,216,752

SPILL VALVE FOR A FLUID CONTROL SYSTEM

Louis Galan, Ann Arbor, Mich., assignor to The Bendix Corporation, Southfield, Mich.

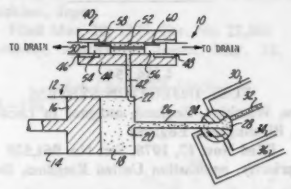
Filed Jun. 30, 1978, Ser. No. 920,926
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—499 **26 Claims**

1. In a distributor-type fuel injection system of the class wherein fuel from a source is supplied under pressure from the chamber of a pump to a distributor which cyclically and separately communicates each of a plurality of injector feed lines with the pump chamber, the improvement comprising:

a spill valve for controlling fuel injection for each injector valve during the time at which its respective feed line is in communication with the pump chamber including;

a valve body having a spill inlet port in communication with the pump chamber and a spill outlet port in communication with the fuel source;

a spill conduit, formed within the valve body, having first and second spill paths therethrough to communicate the inlet port to the outlet port;



first valve means, disposed within the valve body and actuatable between an open condition and a closed condition to control the flow condition of the first spill path;

second valve means, disposed within the valve body and actuatable between an open condition and a closed condition to control the flow condition of the second spill path; and

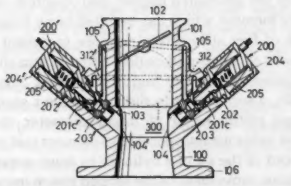
valve connector means, interconnecting the first valve means and the second valve means, and responsive to a closure of the first and second flow paths to store potential energy and an opening of a flow path to release such potential energy.

4,216,753

FUEL AIR MIXTURE SUPPLY SYSTEM FOR USE IN FUEL-INJECTION-TYPE INTERNAL COMBUSTION ENGINE

Tokuta Inoue, Mishima; Takatoshi Masui; Masaki Mitsuyasu, both of Susono; Shigetaka Takada, and Masayuki Okamura, both of Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Kogyo Kabushiki Kaisha, Obu, both of, Japan

Filed Sep. 7, 1978, Ser. No. 940,366
Claims priority, application Japan, Dec. 14, 1977, 52-151041
Int. Cl.[2] F02M *39/00*; B05B *7/04*
U.S. Cl. 123—445 **3 Claims**



1. A fuel-air mixture supply system for use in a fuel-injection-type internal combustion engine having a throttle valve in a suction system, said supply system comprising:

a Venturi portion on the inner surface of said suction system;

at least one fuel injection port in said Venturi portion and open into suction system;

an atomizing chamber having a nozzle and communicating with said fuel injection port through said nozzle;

a fuel injection valve adapted to inject fuel into said atomizing chamber at a predetermined pressure for a predetermined time per a predetermined period;

an air bleed passage providing a communicating passage

between the portion above said throttle valve in said suction system and said atomizing chamber; and

said fuel injection port, atomizing chamber and fuel injection valve are provided in pairs in an identical fashion and said fuel injection ports are substantially oppositely directed; the axes of said fuel injection ports, when extended in a downward direction, do not intersect the axis of said suction system; and each of said fuel injection valves is adapted to inject fuel in an alternate manner.

4,216,754

FUEL INJECTION SYSTEM

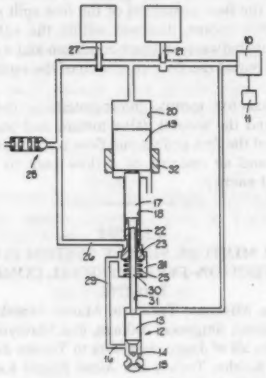
Paul Lakra, Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Nov. 17, 1978, Ser. No. 961,528

Claims priority, application United Kingdom, Dec. 9, 1977, 51265/77

Int. Cl.[3] F02D 5/02

U.S. Cl. 123—447 4 Claims



1. A fuel injection system for supplying fuel to an internal combustion engine and of the kind comprising a source of liquid fuel at high pressure, a fuel injection nozzle having an outlet through which in use fuel can flow to a combustion chamber of the associated engine, said injection nozzle including a valve member which can be lifted away from a seating by the action of fuel at injection pressure to permit fuel to flow from an inlet through said outlet, a first piston slidable within a first cylinder, one end of said first cylinder being connected to said inlet, a second piston slidable within a second cylinder, said second piston being of larger diameter than said first piston, first valve means operable to connect said source of fuel with one end of the second cylinder to cause movement of the second piston, movement of the second piston imparting movement to the first piston, said first piston during such movement displacing fuel at injection pressure to said nozzle, a second valve means operable when said first valve means is closed to permit fuel to escape from said one end of the second cylinder, a first non-return valve through which fuel flowing from said one end of the second cylinder via said second valve means, can flow to said one end of the first cylinder, a second non-return valve through which surplus fuel from said one end of the second cylinder can flow to a drain, and a third piston which is subject to the fuel at high pressure for returning said first and second pistons towards said one end of the second cylinder.

4,216,755

HIGH TENSION DISTRIBUTING DEVICE

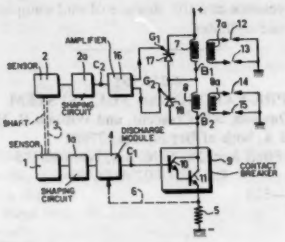
Jean-Pierre Ordines, Clamart, France, assignor to Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

Filed Jun. 5, 1978, Ser. No. 912,713

Claims priority, application France, Jun. 10, 1977, 77 17876

Int. Cl.[2] F02P 7/00

U.S. Cl. 123—643 18 Claims



1. A device for the distribution of high tension for the ignition of the sparking plugs of an internal combustion engine, this device comprising: a plurality of ignition coils each comprising a primary induction winding and a secondary induced winding; a set of sparking plugs; means connecting each sparking plug with at least one of the said ignition coil secondary windings, there being at least as many sparking plugs as there are ignition coils; a plurality of switch means such that there are as many said switch means as there are ignition coils; means connecting each said switch means to shunt a respective one of said primary windings; means operating said switch means successively in the course of time, and in timed relation with the rotation of the engine; a single contact breaker means connected in series with all said primary windings, and means connecting said switch means and said contact breaker means for ensuring that at the instant when the contact breaker means opens, at least one of said switch means is open.

4,216,756

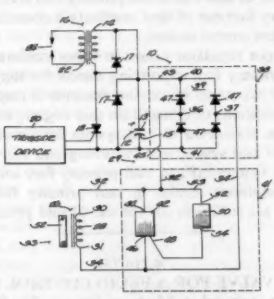
VOLTAGE REGULATED MAGNETO POWERED CAPACITIVE DISCHARGE IGNITION SYSTEM

Richard J. Mura, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 17, 1978, Ser. No. 924,916

Int. Cl.[2] F02P 1/00

U.S. Cl. 123—597 5 Claims



1. A voltage regulated magneto powered capacitive discharge ignition system comprising a charge capacitor having opposite plates, a magneto including a charge coil having opposite end terminals, circuit means for respectively connecting said opposite plates of said charge capacitor to said end terminals of said charge coil and including rectifier means for

insuring unidirectional current flow from said charge coil to said charge capacitor, said rectifier means comprising a full-wave bridge rectifier having input terminals respectively connected to said end terminals of said charge coil, and output terminals respectively connected to said plates of said charge capacitor, and voltage regulator means including three-terminal, bidirectional semiconductor switching means having first, second, and third terminals, said first and second terminals being respectively connected to said end terminals of said charge coil and to said input terminals of said full-wave bridge rectifier, said switching means being rendered conductive between said first and second terminals in response to a current trigger pulse applied to said third terminal and thereby shunting said charge coil, said voltage regulator means also including two-terminal, bidirectional semiconductor trigger means having one terminal connected to said third terminal of said switching means and having another terminal connected to one of said end terminals of said charge coil and one of said input terminals of said full-wave bridge rectifier, whereby said switching means and said two-terminal bidirectional trigger means are isolated by said full-wave bridge rectifier from current surges which result during discharge of said charge capacitor, said trigger means being rendered conductive and applying a current trigger pulse to said third terminal of said switching means in response to voltage developed on said charge capacitor exceeding a predetermined value, whereby said switching means is rendered conductive so that said charge coil is shunted and further charging of said charge capacitor is prevented.

4,216,757

ELECTRICAL CONTROL CIRCUIT, ESPECIALLY FOR A FUEL SUPPLY DEVICE OF AN INTERNAL COMBUSTION ENGINE

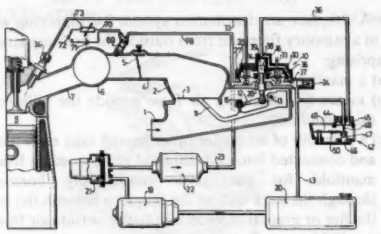
Peter Romann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,143

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715588

Int. Cl.² F02M *51/00*

U.S. Cl. 123—179 L **4 Claims**



1. In an internal combustion engine of the fuel injected type having an intake manifold, a battery, an engine starting switch and a fuel supply system having a high pressure side, an auxiliary fuel supply system for startup at temperatures below a predetermined minimum comprising:

a normally closed electromagnetic valve connecting the intake manifold with said high pressure side of the fuel supply system of said engine; and

a control circuit including a PTC resistor connected in series with said valve and the battery and starting switch of the engine, said resistor being of very low resistance below said predetermined minimum temperature and having a resistance temperature characteristic which rises substantially above said minimum temperature, whereby said valve is opened when the starting switch is closed below said minimum temperature but remains closed when the temperature is only slightly above said predetermined temperature, said control circuit having a current flow which flows through said PTC resistor when said starting switch is closed which heats said PTC resistor for a specific duration in accordance with the characteristics of said PTC resistor until said predetermined temperature is attained whereby said specific duration determines the period of time for the metering of the supplementary fuel quantity to said engine.

4,216,758

AUTOMOBILE FUEL INTAKE SYSTEM

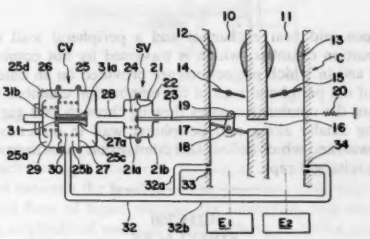
Sadashichi Yoshioka, Aki, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Mar. 20, 1979, Ser. No. 22,365

Claims priority, application Japan, Mar. 22, 1978, 53-36447[U]

Int. Cl.² F02D *17/00*

U.S. Cl. 123—198 F **6 Claims**



1. A fuel intake system for a multi-cylinder internal combustion engine having at least first and second engine cylinders, which comprises, in combination:

an intake passage means having inlet means communicated to a source of combustible air-fuel mixture and at least first and second outlet conduits communicated respectively to the first and second engine cylinders;

throttle valve means adjustably positioned in said inlet means for controlling the rate of delivery of the combustible air-fuel mixture to the engine cylinders;

at least one shutter valve operatively positioned in said first outlet conduit for pivotal movement between opened and closed positions at a position downstream of the throttle valve means with respect to the direction of flow of the combustible air-fuel mixture towards the engine cylinders;

biasing means for urging said shutter valve to the opened position; and

means operable in response to a composite negative pressure, made up of a negative pressure developed in the first outlet conduit downstream of the shutter valve and a negative pressure in the second outlet conduit, for bringing the shutter valve to the closed position against the biasing means, when said composite negative pressure exceeds a predetermined value, thereby communicating the second engine cylinder to the source of the combustible air-fuel mixture.

4,216,759

AUXILIARY HEATER FOR VEHICLES

Reiner Friedl, Starnberg; Dieter Zeus, Icking; Friedrich Widemann, Munich, and Werner Hornfeck, Unterpfaffenhofen, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 899,158

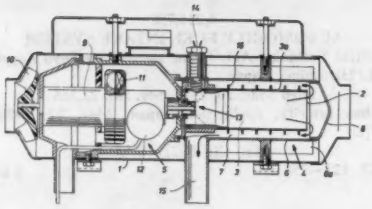
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718215

Int. Cl.² F24H *3/06*

U.S. Cl. 126—110 B **4 Claims**

1. Auxiliary heating device for fluid fuels, particularly for

vehicles, comprising a casing which contains a tubular combustion chamber having a peripheral wall open at one end, a heat exchanger for the medium to be heated mounted in said casing in a manner forming a path for said medium along an outer surface thereof, and a burner unit, said heat exchanger comprising a pipe closed at one end and concentrically surrounding the combustion chamber to form an annular gap

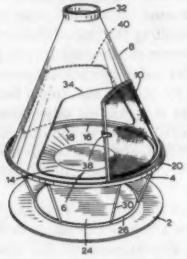


between said heat exchanger and a peripheral wall of the combustion chamber, which is traversed by hot combustion gases and in which projections are provided on an outer surface of the peripheral wall of the combustion chamber which prevent the combustion gases flowing through said gap from passing axially along said peripheral wall in direct contact therewith and which deflect said combustion gases toward said heat exchanger pipe.

4,216,760
FIREPLACES

William H. Wiggins, 250 Don Park Rd. Unit 12, Markham, Ontario, Canada

Division of Ser. No. 720,566, Sep. 7, 1976, which is a continuation-in-part of Ser. No. 549,837, Feb. 13, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,350
Int. Cl.[2] F24B *1/18*
U.S. Cl. 126—120 **8 Claims**

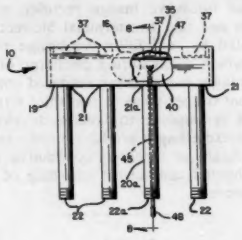


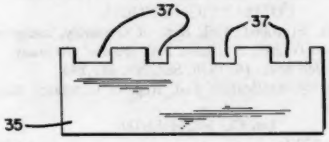
1. A fireplace comprising a plurality of components arranged coaxially one above another, including a stand, an imperforate dished fire-pan forming a grateless fire box to receive a fire and supported by the stand, the stand being configured to permit unobstructed convection of air over the whole of the lower surface of the fire-pan, a fire enclosure standing on the fire-pan, the fire enclosure comprising a cone tapering from a base, of substantially the same dimensions of the fire-pan and extending around the full periphery of the cone, to a flue opening at its upper end, the cone defining an opening above and to one side of the upper surface of the fire-pan, a generally frusto-conical casing covering the cone and defining an air circulation space surrounding the cone, the casing having an opening in register with that in the cone, and a screen member provided between the cone and the casing to close the openings defined in said cone and said casing, wherein the casing terminates in a top flange of greater diameter than the flue opening of the cone, so as to define an air gap between the flange and the flue opening, and the lower end of the casing is configured to provide an air entry to the air space between the casing and the cone, and wherein the components of the fireplace are stackable coaxially one within another in an alternative overlapping relationship for transit.

4,216,761
FIREPLACE AIR DISTRIBUTION SYSTEM

William R. Stegmeier, P.O. Box 373, Dayton, Ohio 45449

Filed Jul. 3, 1978, Ser. No. 921,431
Int. Cl.[3] F24B *1/18*
U.S. Cl. 126—120 **3 Claims**





1. A fireplace air distribution system for supplying air to a fire in a masonry fireplace from outside the building structure, comprising:

(a) a manifold,

(b) means for admitting air from outside the building into said manifold,

(c) a plurality of air feeder tubes having inlet ends mounted and connected into said manifold and extending from said manifold for installation substantially horizontally through the back wall of the fireplace beneath the level of the fire or grate therein to supply the outside air from said manifold to the fire,

(d) perforated baffle plate means disposed angularly within said manifold to slope upwardly away from said tubes for distributing the air evenly to each of said tubes and for throttling the flow of the air to protect against wind gusts and to reduce the discharge velocity of the air as it exits from said tubes into the fire,

(e) shutoff means within said manifold for shutting off the supply of air from said manifold into said tubes,

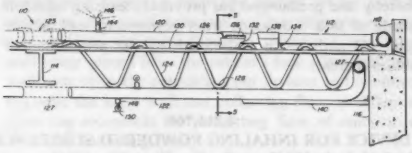
(f) control means for operating said shutoff means from outside said manifold, and

(g) said shutoff means including a shutoff plate disposed between said tubes and said baffle plate and adapted to be moved by said control means between a closed position in which it lies across and blocks the inlet ends of said tubes, and an open position wherein said shutoff plate rests upon said baffle plate away from the inlet ends of said tubes and does not block the flow of air into said tubes from said manifold.

4,216,762
COMBINED STRUCTURAL SUPPORT AND SOLAR ENERGY SYSTEM

William J. Klaila, 399 Marion Rd., Middleboro, Mass. 02346

Filed Dec. 1, 1977, Ser. No. 856,418
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—421 14 Claims



1. A structural support and solar energy system for use in building construction, said system comprising:

(a) a plurality of joists, each said joist including a first chord through which a first fluid flows and a second chord through which a second fluid flows, and a web to which said first and second chords are attached;

(b) a solar energy absorbing stratum mounted to said first chords for heating said first fluid in said first chords, said first chords defining a solar collector;

(c) first pump means connected to said first chords for circulating said first fluid;

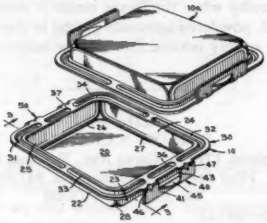
(d) second pump means connected to said second chords for circulating said second fluid; and

(e) heat exchanger means connected to said first chords and said second chords, said first heated fluid circulated through said heat exchanger means for transferring heat between said first fluid in said first chords and said second fluid in said second chords.

4,216,763
TOASTER/OVEN ACCESSORY PAN WITH HANDLE

Frank C. Miklas, Allentown, Pa., assignor to General Electric Company, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,930
Int. Cl.[3] F23L 3/00, 11/00, 13/00
U.S. Cl. 126—275 R 13 Claims



1. A toaster/oven accessory pan for cooking small food items in toaster/ovens, the toaster/oven accessory pan comprising:

(A) a flat generally rectangular major panel having integral sidewalls extending upwardly therefrom and an integral peripheral flange extending outwardly from and surrounding the top edges of the sidewalls; and

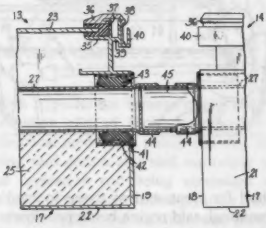
(B) a handle having a handle projection integral with the peripheral flange, the handle projection extending downwardly from the peripheral flange juxtaposed a first one of the sidewalls, and the handle projection defining a slot opening for receiving the tines of a fork,

whereby a fork may be inserted in the slot opening for lifting and carrying the toaster/oven accessory pan, the bottom of the fork tines engaging against the finger projection defining the slot opening, the top of the tines engaging against the peripheral flange and the ends of the tines butting against the sidewall juxtaposed the handle projection.

4,216,764
SOLAR ENERGY COLLECTOR SYSTEM INCLUDING APPARATUS FOR BALANCING HEAT-EXCHANGE FLUID FLOW

Peter D. Clark, New Haven, Conn., assignor to Sunworks, Inc., Guilford, Conn.

Filed Sep. 14, 1978, Ser. No. 942,468
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—448 16 Claims

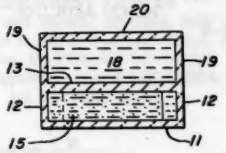


1. In an array including at least two liquid-type solar collectors, each having a header, a cup-shaped member adapted to connect between the headers of the collectors to facilitate the balanced flow of liquid through the collectors, said member having a cylindrical wall and a base defining an orifice adapted to permit liquid to flow therethrough dimensioned to balance the flow of liquid passing through the collectors.

4,216,765
TRANSPARENT SOLAR HEAT COLLECTOR

Czeslaw Deminet, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 1, 1978, Ser. No. 882,533
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—449 5 Claims



1. A transparent solar heat collector utilizing solar radiation for heating and illuminating a building structure, said transparent solar heat collector comprising:

an absorber comprising, a collection of transparent converter glass particles absorptive by internal dispersion of at least 90% of the infrared radiation within the spectrum of incident solar radiation on said glass for conversion of infrared radiation into thermal energy and transmittive of at least 70% of the visible spectrum of solar radiation,

a glass panel including front and rear walls transparent to visible radiation, said walls forming a confining space for carrying said transparent converter glass particles for exposure to solar radiation and the transmission of visible radiation into said building structure, said front wall transparent to infrared radiation within the spectrum of solar radiation, and

means to pass a fluid medium which is transparent to visible radiation into heat transfer contact with said transparent converter glass particles to transfer thermal energy from

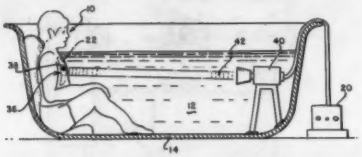
said transparent converter glass particles to said fluid medium and into said building structure.

4,216,766

TREATMENT OF BODY TISSUE BY MEANS OF INTERNAL CAVITY RESONANCE

Ludwig R. Duykers, and Joseph L. Percy, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 7, 1979, Ser. No. 73,399
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—773 **15 Claims**



1. A method for treatment of tissue located in a specified region of a mammal, said region being proximate to a gas filled cavity which is contained in a fluid medium within the mammal, said method comprising the steps of:

determining the resonance frequency of said cavity;

generating an acoustic signal having a frequency which is equal to said resonance frequency;

directing said acoustic signal upon said cavity to resonate said cavity at a selected level of intensity until a first phase of said treatment has been concluded; and

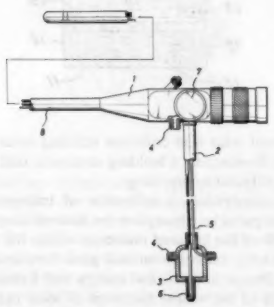
performing a second phase of said treatment after the conclusion of said first phase.

4,216,767

ENDOSCOPE WITH CLOSED PRESSURIZED INNER CAVITY

Hisatake Aoshiro, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1978, Ser. No. 877,899
Claims priority, application Japan, Feb. 21, 1977, 52/19060
Int. Cl.² A61B *1/06*
U.S. Cl. 128—6 **6 Claims**



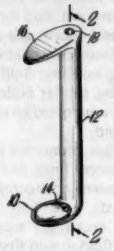
1. An endoscope comprising a grip end, an elongated sheath adapted to fit into a body orifice having a distal end and a proximal end, a fiber optic bundle extending from said proximal end to said distal end of said sheath, said grip end connected with said sheath and said sheath terminating in an examining end, said endoscope including said sheath having a closed inner cavity portion, the portions of said endoscope forming the walls of said closed cavity being non-expandable, said cavity extending along a major portion of said sheath, said sheath being flexible gas inlet means communicating with said closed inner cavity portion of said endoscope, a source of pressurized gas connected to said gas inlet means to introduce pressurized gas into said closed inner cavity portion to be contained therein coupling means for enabling repeated connection between said source of pressurized gas and the gas inlet means for repeatedly pressurizing the inner cavity portion, whereby said pressurized gas prevents cleansing liquid on the outside of said endoscope from permeating said sheath and highlights pinholes in said sheath by the production of gas bubbles thereat.

4,216,768

DEVICE FOR INHALING POWDERED SUBSTANCE

Whitfield Jack, 423 Front St., Key West, Fla. 33040

Filed Mar. 23, 1978, Ser. No. 889,413
Int. Cl.² A61M *15/00*
U.S. Cl. 128—203.15 **2 Claims**



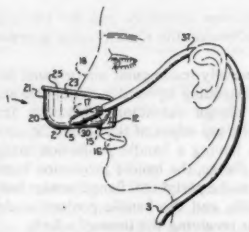
1. A device for administering powdered medicinal substances by inhaling through a nostril comprised of planar flange means adatped to occlude a person's nostril opening having an aperture there through, a concave spoon, the spoon having a predetermined volume, a hollow tube, the tube having a first end mounted to the spoon, the hollow interior of the tube opening into the spoon concavity and the second end of the hollow tube mounted to the flange means, the hollow interior of the tube opening through the aperture in the flange means, whereby when the flange means is placed over a person's nostril, powdered substance placed in the spoon concavity may be readily inhaled through the hollow tube into the patient's nostril.

4,216,769

BI-FLOW NASAL CUP

Jerry L. Grimes, 1798 N. Gareg Ave., Pomona, Calif. 91767

Filed Sep. 29, 1978, Ser. No. 947,005
Int. Cl.² A61M *16/00*
U.S. Cl. 128—207.13 **3 Claims**



1. A bi-flow nasal inhalation cup comprising:

(a) a generally crescent shaped cup member of lightweight,

relatively flexible plastic material having a collecting floor having inner and outer laterally arched margins;

(b) an upright, curved inner wall connected to said inner margin and having sidewardly flaring wing portions contoured to smoothly and gently rest against the upper lip area of a patient;

(c) an upright, curved outer wall connected to said outer margin and having a vertically arched center portion extending above said inner wall and merging into opposite arm portions smoothly diverging therefrom, said outer wall being spaced from the patient's face when said inner wall rests upon the patient's upper lip area and cooperating with the inner wall and collecting floor to define an open top receptacle for permitting flow of ambient air onto said collecting floor;

(d) opposed cannula inlets extending generally tangentially through opposite arm portions of said outerwall and pointing generally downwardly toward said collecting floor for connection to an oxygen gas carrying cannula for turbulent, swirling flow of oxygen gas into the receptacle for well integrated mixing with air coming over said outer wall, thereby providing such mixture adjacent a patient's nostrils for inhalation by the patient; and

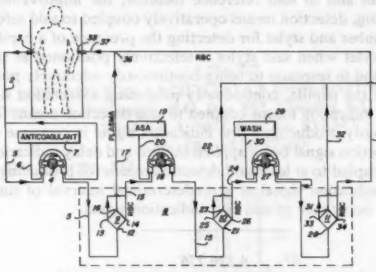
(e) means connecting said cup to a patient's face.

4,216,770

SICKLE CELL THERAPEUTIC TREATMENT

Herbert M. Cullis, Silver Spring, Md., and Evelyn E. Dorsey, Washington, D.C., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 9, 1979, Ser. No. 10,941
Int. Cl.[2] A61M *5/00*; B01D *21/26*
U.S. Cl. 128—214 R **9 Claims**



1. A process for treating sickle cell disease including the step of withdrawing whole blood substantially continuously from a patient and during said withdrawal of said whole blood performing the following steps:

directing the whole blood to a red cell separator;

separating red blood cells to be treated from said plasma by centrifugation;

directing the centrifuged separated red blood cells to be treated to a reaction chamber;

introducing an anti-sickle agent into said reaction chamber and mixing the anti-sickle agent with the red blood cells to be treated;

directing red blood cells mixed with the anti-sickle agent to a wash chamber;

introducing washing medium into the wash chamber and washing by centrifugation the red blood cells mixed with the anti-sickle agent;

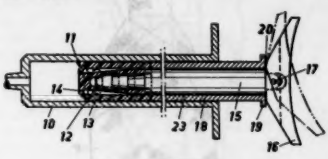
removing the washed red blood cells from the centrifuge and directing the washed, treated red blood cells back to the patient.

4,216,771

HYPODERMIC SYRINGE WITH ASPIRATION EFFECT

Sven Arlers, Göteborgsväen 77, and LGunnar Nilsson, Blankavägen 46, both of Partille, Sweden (433 00)

Filed Dec. 5, 1977, Ser. No. 857,619
Claims priority, application Sweden, Dec. 14, 1976, 7611663; Feb. 23, 1977, 7701971
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 P **8 Claims**



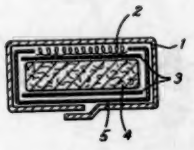
1. An aspiration hypodermic syringe comprising a cylindrical member, a piston and an aspirating member contained within said cylindrical member, a piston rod and an aspiration rod for operating said piston and said aspirating member respectively, said aspiration rod being contained within said piston rod and said piston rod and aspiration rod extending from one end of said cylindrical member, said piston and aspirating member being arranged for limited relative axial movement, said aspirating member having an inner limit of axial movement relative to said piston and an outer limit of axial movement relative to said piston and actuating means at an outer end of said aspiration rod for manually outwardly displacing said aspiration rod relative to said piston rod when said aspirating member is at its inner limit of axial movement relative to said piston to provide an aspirating movement of said aspirating member relative to said piston wherein said actuating means comprises a transverse member pivotally connected at said outer end of said aspiration rod, said transverse member having a camming surface for engaging the outer end of said piston rod and axially moving said aspiration rod relative to said piston rod by rocking movement of said camming surface relative to said outer end of the piston rod.

4,216,772

ABSORBENT ARTICLE

Yoshimi Tsuchiya, and Hiroshi Mizutani, both of Yachiyo, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,886
Claims priority, application Japan, Feb. 8, 1978, 53-13136
Int. Cl.[3] A61F *13/16*
U.S. Cl. 128—284 **6 Claims**



1. In an absorbent article for absorbing body fluids and exudations comprising an absorbent core which is partially or completely enveloped by a surface cover layer, wherein said surface cover layer is a non-woven fabric having a weight of about 15 to 30 g/m^2 and is made of a fibrous composition consisting essentially of about 60 to 90 wt. % of hydrophilic fibers and about 40 to 10 wt. % of hydrophilic fibers, the improvement which comprises: said hydrophilic fibers consist essentially of from about 10 to 90 wt. % of hydrophilic fibers having a thickness of about 1.5 to 3 denier and from about 90 to 10 wt. % of hydrophilic fibers having a thickness of about 4 to 7 denier.

4,216,773

DISPOSABLE DIAPER WITH CENTER FOLDED EDGES

A. Sensor Ryan, Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 30, 1979, Ser. No. 25,439
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 6 Claims

1. A diaper pad having increased absorbent material in the area of maximum wetting, the pad constructed from a generally rectangular piece of absorbent material, wherein the improvement comprises;

a pair of longitudinal slits generally parallel to each other and to the sides of the pad, the slits extending from the front end toward the back end of the pad;

a pair of flaps defined by fold lines symmetrical about a longitudinal axis, the fold lines originating on opposite sides of the pad at or near the corners of the back end of the pad and extending generally to the inner ends of the adjacent slits;

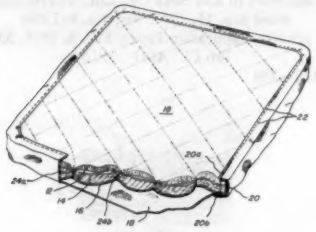
the flaps being folded over the surface of the pad to lie in substantially the same plane, thereby defining a generally Y-shaped diaper having a central portion with at least three layers of absorbent material over part of the maximum wetting area.

4,216,774

MEDICAL PAD

Helen E. Graber, Lino Lakes, Minn., assignor to Alegra Products, Inc., Long Lake, Minn.

Filed Nov. 13, 1978, Ser. No. 959,629
Int. Cl.[3] A61F *13/18*
U.S. Cl. 128—296 2 Claims



1. A medical pad for incontinent use comprising:

a. a first top layer of one hundred percent polyester material having softness and nonabrasive qualities;

b. a second inner layer to align with said first top layer of absorbing material of bonded six to eight ounce polyester;

c. a third inner layer to align with said first and second layers of fiberglass structural material;

d. a fourth layer of liquid repellent waterproof oxford nylon material to align with said first, second and third layers;

e. binding liquid repellent waterproof oxford nylon material surrounding the outer perimeter edges of said first, second, third and fourth layers;

f. first stitching between the top and bottom of said binding and through the four layers to bind the four layers together, and;

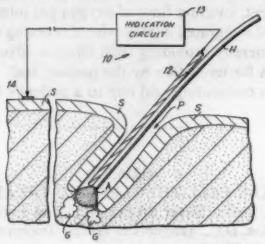
g. second vertical and horizontal crisscross stitching the first, second and third pads together whereby said second stitching of the first, second and third pads together prevents bunching and movement of the first, second and third pads, and said first stitching of the four pads together thereby provides a medical pad which is warm even when wet to a patient on the top of said pad and prevents leakage through the bottom of said pad onto physical facilities.

4,216,775

ELECTROLYSIS HAIR REMOVAL APPARATUS

Hugh V. Cottingham, Upper Montclair, N.J., assignor to Inverness International Corporation, Englewood, N.J.

Filed Nov. 30, 1978, Ser. No. 964,866
Int. Cl.[3] A61B *17/36*
U.S. Cl. 128—303.18 23 Claims



1. In an electrolysis apparatus including a conductive reference member, a conductive stylet adapted to be selectively positioned near the papilla, and a voltage supply coupled to said stylet and to said reference member, the improvement comprising, detection means operatively coupled to said reference member and stylet for detecting the presence of a papilla at said stylet when said stylet is selectively positioned at the papilla, and in response to being continuously selectively positioned at the papilla, continuously producing a detection signal, first indication means coupled to said detection means for continuously producing a first indication signal in response to said detection signal being applied thereto and delay indication means coupled to at least said detection means for producing a second indication signal at a predetermined interval of time after the occurence of said first indication signal.

4,216,776

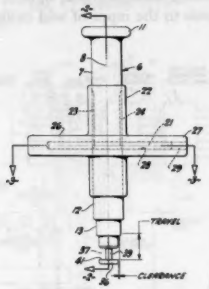
DISPOSABLE AORTIC PERFORATOR

David E. Downie, Lafayette; Robert J. Harvey, Danville, and John R. Rueff, Concord, all of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed May 19, 1978, Ser. No. 907,761
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 8 Claims

1. A disposable aortic perforator comprising an elongated stem having an exterior stem surface circular-cylindrical about a longitudinal axis and extending between a far end and a near end; a coaxial disc having an exterior, circumferential cylindrical disc surface of a first predetermined diameter; means defining a near surface on said disc normal to said axis and meeting said cylindrical disc surface substantially at a right angle forming an outside corner supportive of a length of adventitia disposed substantially in a right-angle configuration abutting against said near surface and said disc surface; an axial shank connecting said disc and said far end of said stem; and elongated tube telescoped over and axially movable on said stem, said tube having an interior, circumferential cylindrical tube surface disposed to telescope over said exterior cylindrical disc and of a second predetermined diameter slightly larger than

said first predetermined diameter and defining an annular clearance space of predetermined radial dimension at least as great as the thickness of a length of said adventitia disposed between said interior tube surface and said exterior disc surface; means defining an annular surface on said far end of said tube normal to said axis and meeting said interior tube surface



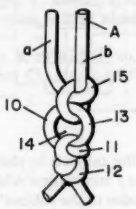
surface substantially at a right angle and forming an inside corner supportive of said length of adventitia disposed substantially in a right-angle configuration abutting against said annular surface and said interior tube surface; a cross bar normal to said axis, means for fixing said cross bar in said stem; a spring for urging said tube axially away from said disc; and means for limiting axial movement of said tube relative to said stem.

4,216,777

METHOD FOR ARTIFICIALLY IMPLANTING HAIR

William J. Pridemore, P.O. Box 883, Clemson, S.C. 29631

Filed Jul. 1, 1977, Ser. No. 812,347
Int. Cl.[3] A61B *17/00*
U.S. Cl. 128—330 4 Claims



1. A method of artificially implanting a hair in the human skin tissue comprising the steps of:

providing a single strand of hair;

providing an enlarged anchor which includes a second strand having an annular configuration;

securing said anchor to said single strand intermediate the ends thereof by knotting said strand about said anchor;

folding said single strand upon itself about said anchor strand to define a pair of strands extending from said anchor so that said anchor is secured between said pair of strands within a bend portion thereof; and

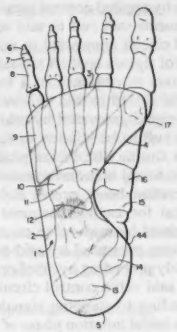
implanting said anchor in said skin tissue with said pair of strands exposed above the skin surface.

4,216,778

ORTHOPEDIC APPLIANCE

Dennis H. Weiss, 118 E. North St., Wooster, Ohio 44691

Filed Mar. 22, 1978, Ser. No. 888,936
Int. Cl.[2] A61F *5/14*
U.S. Cl. 128—581 9 Claims



1. An orthopedic appliance to support a foot in a normal weight bearing posture, comprising:

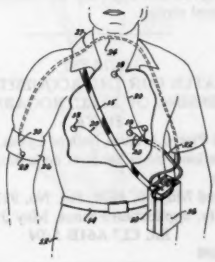
a rigid plate having an upper foot engaging surface adapted to conform to the normal weight bearing posture of the wearer's foot, and having an outside lateral edge adapted to generally extend outside of the cuboid and heel bones, a rear edge adapted to extend outside of the heel bone area, a forward edge adapted to extend beneath the forward portion of the metatarsal bones, and an inner periphery being concave toward the lateral outside edge so as to be adapted to extend adjacent the inside portion of the heel bone without being adapted to extend supportingly beneath the medial arch.

4,216,779

BLOOD PRESSURE MONITORING SYSTEM

W. David Squires; Donald L. Anderson, both of Huntington Beach, and Isaac R. Cherry, Mission Viejo, all of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed May 16, 1977, Ser. No. 796,893
Int. Cl.[2] A61B *5/02*
U.S. Cl. 128—682 32 Claims



1. A portable apparatus for long-term ambulatory monitoring and recording of a patient's systolic and diastolic blood pressure by the auscultatory method, requiring no intervention by the patient and comprising in combination:

an inflatable cuff affixable to the patient;

a source of fluid under pressure for inflating said cuff to an initial inflation pressure greater than the patient's systolic blood pressure during an initial phase of each cycle of operation in response to an applied inflation signal, and

thereafter for remaining sealed off from the cuff during the remainder of each cycle of operation;

a pressure transducer for sensing the pressure of the fluid in said cuff and for generating a pressure signal representative of the pressure;

a valve connected to the cuff and having a normal first state in which it vents said cuff to a region of lower pressure, and alterable by applied control signals to a second state in which it connects said cuff to said source of fluid;

a valve control circuit connected to said valve and generating the control signals applied to said valve to selectively control its state in response to a stored initial inflation pressure signal stored in said valve control circuit and to the pressure signal generated by said pressure transducer to cause said cuff to be inflated to the stored initial inflation pressure during the initial phase of each cycle of operation, the initial inflation pressure signal for the first cycle of operation being preset and the initial inflation pressure signal for each subsequent cycle of operation being determined by said valve control circuit from the greatest pressure measured by said portable apparatus in the immediately preceding cycle of operation and retained in storage by said valve control circuit, said valve control circuit responding to stepping signals generated and applied after the initial inflation phase of each cycle of operation to initiate the control signals applied to said valve to selectively and intermittently vent said cuff to a region of lower pressure momentarily producing an abrupt decrease of the cuff pressure by a constant predetermined decrement upon the occurrence of each of said stepping signals until the cuff pressure has been reduced through a series of constant pressure decrements from the initial inflation pressure greater than the patient's systolic blood pressure to a final cuff pressure less than the patient's diastolic blood pressure;

a K-sound transducer positioned on the patient in relation to said inflatable cuff for sensing the patient's K-sounds during the intervals when the cuff pressure is constant between successive pressure decrements and for generating a K-sound signal representative of the K-sounds;

a discrimination circuit responsive to the K-sound signal for identifying the first and last of the K-sounds sensed by said K-sound transducer in each cycle of operation and responsive to the pressure signal for producing an output data signal representing the systolic and diastolic pressures sensed by said pressure transducer at the time of occurrence within each cycle of operation of the first and last K-sounds respectively, said discrimination circuit connected to said valve control circuit and producing the stepping signals and applying the stepping signals to said valve control circuit.

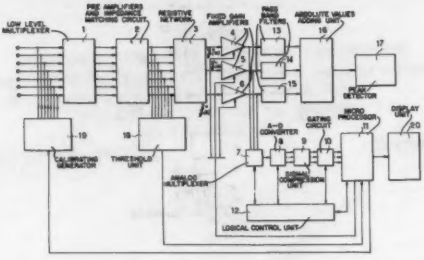
4,216,780

APPARATUS FOR THE ACQUISITION AND PRE-PROCESSING OF ELECTROCARDIOGRAPHIC DATA

Paul Rubel, and Pierre Arnaud, both of Lyons, France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

Filed May 30, 1978, Ser. No. 911,018
Claims priority, application France, May 31, 1977, 77 16462
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—699 **13 Claims**

1. A portable apparatus for the acquisition and pre-processing of vectocardiographic data, said apparatus comprising: a plurality of electrodes arranged according to Frank's orthogonal system; first means having a plurality of inputs connected to the respective electrodes for multiplexing and pre-amplifying the said vectocardiographic data; second means, including a Frank resistive network connected to the said first means, for converting the said data into scalar signal components having a base line; third means, connected to the said second means, for amplifying the said scalar signal components; analog-to-digital converter means, connected to the said third means, for converting the amplified scalar si signal components into digital signals; calibration means, including an analog calculation network, for generating calibration signals of predetermined amplitude and for applying the said calibration signals to the said inputs of the first means under the control of control signals during a predetermined time interval; micro-processor means for processing the said digital signals, for providing the said control signals to the input of said calibration means, for



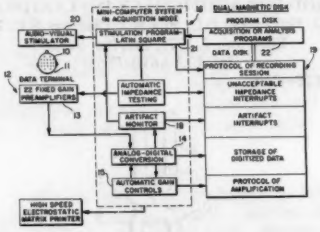
analysing the response of the first, second and third means to said calibration signals, and for deriving from the said response a determination of the gain and pass-band of the said first, second and third means, said microprocessor means further applying clamping signals to said third means for clamping the said base line to zero at the beginning and end of the said predetermined time interval and, subsequently, at fixed time intervals each corresponding to a data acquisition sequence.

4,216,781

METHODS OF ELECTROPHYSIOLOGICAL TESTING

E. Roy John, 930 Greacen La., Mamaroneck, N.Y. 10546

Filed Jun. 26, 1978, Ser. No. 918,731
Int. Cl.[3] A61B 5/04
U.S. Cl. 128—731 **11 Claims**



1. A method of testing subjects to characterize the subject's ability to inhibit sensory stimulation which comprises:

(a) attaching electrodes to the subject's head and presenting the subject with primary meaningful sensory stimulus,

(b) simultaneously superimposing secondary meaningless sensory stimuli on said primary sensory stimulus,

(c) sensing the electrical brain responses of the subject,

(d) presenting the subject with said secondary stimuli without said primary stimulus,

(e) sensing the subject's electrical brain responses,

(f) making a first comparison using a digital computer-based system of the responses evoked by said primary and secondary stimuli with the responses evoked by said secondary stimuli alone, and

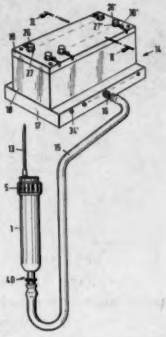
(g) making a second comparison using a digital computer-based system of said first comparison with a set of standard norms as an indication of the subject's ability to inhibit secondary stimuli.

4,216,782

DEVICE FOR THE EXTRACTION OF BLOOD

Walter Sarstedt, 5223 Nümbrecht, Rommelsdorf, Fed. Rep. of Germany

Filed Feb. 14, 1978, Ser. No. 877,699
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1977, 2706247; Feb. 15, 1977, 2706303
Int. Cl.[2] A61B 5/14
U.S. Cl. 128—764 16 Claims



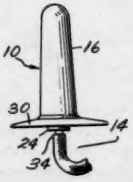
1. A device for the extraction of blood, comprising:
a cylindrical receiving container, closed at one end except for an opening in said one end;
a connecting socket connected to said container at the end opposite said one end and closing said end except for a socket connectable to a cannula which socket is open or openable into said cylinder;
a piston air-tightly guided and shiftable within said cylinder;
a connecting hose, one end of which is inserted in said opening in said cylinder; and
suction means connected to the other end of said hose for applying a slow and uniform drawing-off of air, through said hose, from the portion of said cylinder between said piston and said one end having said opening.

4,216,783

PNEUMATIC MONITOR FOR INDICATING STRENGTH OF CONTRACTILE MUSCLES

Howard Kaiser, 1118 Ave. Y, Brooklyn, N.Y. 11235, and Laurie A. C. Kaiser, c/o Yondale 248/1 Chemin des Romains, 06250 Mougins, France

Filed Mar. 9, 1978, Ser. No. 884,819
Int. Cl.[2] A61B 5/10
U.S. Cl. 128—778 15 Claims



1. In a monitor for indicating movement of contractile muscles in the wall of a body cavity including a compressible bulb assembly insertable into the body cavity and a gauge assembly connected to the bulb assembly and responsive to air pressure changes effected in the assemblies by contraction and relaxation of the muscles in the wall of the body cavity, an improved gauge assembly which comprises a barrel having an interior chamber in communication with the interior of the bulb assembly, a balloon having inner and outer surfaces and a mouth connected to the barrel to expose one of said surfaces of the balloon to the air pressure in the barrel chamber, the wall of said balloon being movable into and out of one end of said barrel, means biasing said balloon to a position within said chamber such that upon a predetermined increase in air pressure in said chamber said biasing means is overcome and said balloon begins to move out of said one end of said barrel to thereby indicate the degree of contraction of the contractile muscle.

4,216,784

TOBACCO COMPOSITION

Vello Norman, Raleigh, and Herman G. Bryant, Jr., Durham, both of N.C., assignors to Liggett Group Inc., Durham, N.C.

Continuation of Ser. No. 619,536, Oct. 3, 1977, Pat. No. 4,055,191, which is a continuation-in-part of Ser. No. 458,355, Apr. 5, 1974, abandoned. This application Oct. 17, 1977, Ser. No. 842,830
The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.
Int. Cl.[3] A24B 15/28
U.S. Cl. 131—17 R 8 Claims

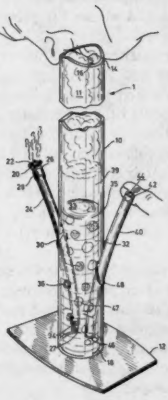
1. A smoking composition comprising:
(a) tobacco,
(b) palladium in an amount of from about 0.001 to about 1 weight percent based on the weight of the tobacco, and
(c) an inorganic nitrite salt in an amount of from about 0.25 to about 0.75 weight percent calculated as added nitrite nitrogen.

4,216,785

WATER PIPE OR BONG

William V. Erickson; Paul K. Jarvie, both of Salt Lake City, Utah, and Fred L. Miller, 7417 S. State St., Midvale, Utah 84047, assignors to Fred Lynn Miller, Midvale, Utah

Filed Aug. 25, 1977, Ser. No. 827,691
Int. Cl.[3] A24F 1/14, 1/30
U.S. Cl. 131—173 24 Claims



1. A water pipe or bong comprising:
a chamber having a lower portion adapted to contain water and an upper portion adapted to form with the surface of the water a liquid free generally enclosed space for collecting and containing smoke,
an upwardly disposed bowl wherein a suitable substance may be combusted to produce smoke,
controllable tubular fluid communication means for the smoker to selectively cause smoke from the bowl and air from the atmosphere to be directed sequentially or simultaneously to the interior of chamber below the surface of

the water therein, said means carrying at least one finger controllable orifice communicating between the atmosphere and the interior of said means, the orifice being generally closed by the smoker to direct smoke to the chamber and generally opened by the smoker to direct air to the chamber, and

mouthpiece means carried by the upper portion of the chamber, so that the smoker may apply suction to the interior of the chamber.

4,216,786

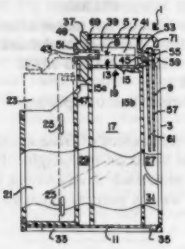
SMOKING DEVICE

Ronnie G. Wright, Shelby, N.C., assignor to High Tech, Inc., Boston, Mass.

Filed Jun. 15, 1979, Ser. No. 49,022

Int. Cl.³ A24F 1/26, 3/00

U.S. Cl. 131—180 **12 Claims**



1. A smoking device comprising:

a base member having at least three compartments therein, said compartments including a first compartment for rotatably retaining a longitudinal burning chamber, a second compartment for retaining a material to be smoked, said second compartment being in dispensing communication with said first compartment, and a third compartment for retaining therein a means for providing a flame to said burning chamber;

a longitudinally extending, hollow burning chamber comprised of a side wall, a front wall and a rear wall, said side wall having located therein a loading orifice, said front wall having located therein a flame admitting orifice and said rear wall having located therein an exit orifice, said chamber being retained in said first compartment so as to be rotatable thereby to bring said loading orifice into and out of dispensing communication with said second compartment and further so as to locate said flame admitting orifice in proximal alignment with said third compartment;

a smoking stem rotatably attached to said base member, said stem being provided with a smoking orifice so located that upon rotation of said stem, said smoking orifice may be aligned or unaligned with said exit orifice; and

means for opening or closing said loading orifice when said loading orifice is out of dispensing communication with said second compartment.

4,216,787

HAIR WAVING ASSEMBLY

Victor Moea, 3555 Hyland Blvd., Staten Island, N.Y. 10308

Filed Oct. 2, 1978, Ser. No. 947,724

Int. Cl.² A45D 2/02

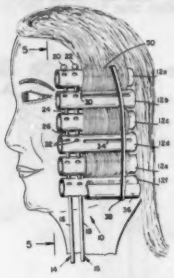
U.S. Cl. 132—39 **10 Claims**

1. A hair waving assembly comprising at least one elongated rod,

a plurality of tubular hair rollers,

and means mounting each of said rollers at one end portion thereof on said rod for sliding movement thereon with said rollers disposed parallel to each other and their end edges aligned with each other,

said rod being located adjacent to the aligned edges at one end of said rollers with a major portion of each roller extending perpendicularly from said rod and being unobstructed for the wrapping of a tress of hair thereabout,



said mounting means providing a frictional fit for said rollers on said rod, whereby said rollers may be moved along said rod between a first position in which said rollers are spaced apart, and a second position in which said rollers are pressed close together.

4,216,788

COIN PROCESSING MACHINE

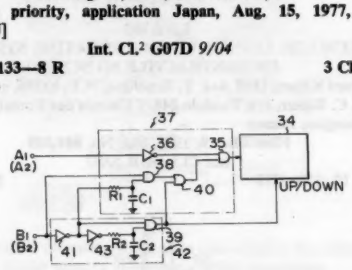
Kenkichi Watanabe, and Katusuke Furuya, both c/o Laurel Bank Machine Co., Ltd., No. 2, Toranomon, Shiba, Minato-ku, Tokyo, Japan

Filed Aug. 11, 1978, Ser. No. 933,025

Claims priority, application Japan, Aug. 15, 1977, 52-108923[U]

Int. Cl.² G07D 9/04

U.S. Cl. 133—8 R **3 Claims**



1. A coin processing machine for counting coins to process the counted coins by bringing one by one the coins, which are guided into their path, into contact with a counting gear thereby to turn the counting gear, comprising:

a shaft mounted to said counting gear for rotation therewith;

pulse generating means mounted to the shaft for generating two groups of pulse signals having different phases;

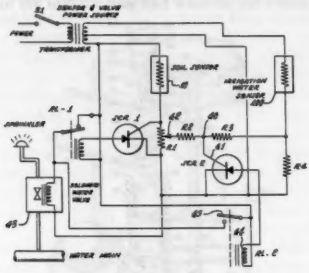
rotational direction discriminating circuit means responsive to said pulse signals for generating adding pulses when the shaft rotates in the forward direction and subtracting pulses when the shaft rotates in the backward direction; and

reversible counter means for counting one of said adding pulses and said subtracting pulses.

4,216,789
CONDUCTION TYPE SOIL MATRIC POTENTIAL SENSOR

Harold W. Hasenbeck, 1524 Alameda St., Pomona, Calif. 91767

Division of Ser. No. 759,782, Jan. 17, 1977, Pat. No. 4,137,931.
This application Oct. 11, 1977, Ser. No. 841,317
Int. Cl.[2] A01G 25/00
U.S. Cl. 137—78 D 6 Claims



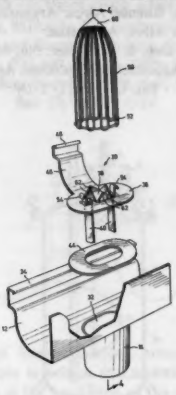
1. In a matric potential sensor, the combination comprising
(a) a housing including a porous wall adapted to be located underground,
(b) spaced electrodes carried in the housing to be coupled to a source of electrical current, and
(c) granular material located to pass electrical current within the housing and between the electrodes so that the current flow will vary as a function of the moisture content of the granular material, said content adapted to vary as a function of the matric potential of the soil surrounding the housing in response to moisture transmission through the porous housing into the surrounding soil,
(d) said sensor being located underground, and including a second and like sensor located in communication with irrigation water, and whose resistance varies as a function of exposure to moisture associated with said irrigation water, and electrical circuit means connected with said sensors to provide a comparison of the electrical resistances of said sensor, whereby the supply of irrigation water may be contolled as a consequence of said comparison.

4,216,790
STORM DRAINAGE SYSTEMS

Richard J. Stoltz, Bramalea, Canada, assignor to R. J. Stoltz Enterprises Inc., Bramalea, Canada

Filed Nov. 27, 1978, Ser. No. 964,247
Int. Cl.[3] E03F 3/00
U.S. Cl. 137—357 8 Claims

1. A storm drainage system comprising,
(a) a plurality of pitched roofed structures,
(b) a sewer service connection associated with each pitched roofed structure,
(c) a municipal sewer drainage system in direct fluid communication with said sewer service connection,
(d) an eavestrough system associated with each pitched roofed structure for collecting runoff water therefrom,
(e) at least one downspout associated with each eavestrough system, each downspout having a through passage for conveying runoff water from its associated eavestrough to the sewer service connection of the associated roofed structure,
(f) flow restricting means in said eavestrough, said flow restricting means having a drainage passage opening therethrough into said through passage of said downspout, said drainage passage having a maximum drainage capacity which is substantially less than the unrestricted flow capacity of the downspout whereby the rate at which water is conveyed to the municipal sewer drainage system in storm conditions is limited to that which the

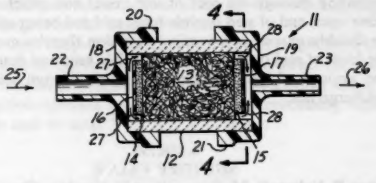


municipal sewer drainage system can accommodate from each pitched roofed structure.

4,216,791
REFLUX CHECK VALVE

Ronald O. Browne, 2420 Calle Galicia, Santa Barbara, Calif. 93109

Filed Jan. 30, 1978, Ser. No. 873,552
Int. Cl.[2] F16K 17/00
U.S. Cl. 137—199 5 Claims



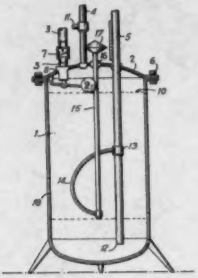
1. A reflux check valve for use in a gas flow system comprising:
a hollow container having a longitudinal axis, a peripheral side wall around said axis, and a pair of ports spaced apart from each other;
a plug of porous material within said side wall through which fluid can flow while passing from port to port;
a material expandable when contacted by liquid, positioned within the container so that liquid flow into the container through at least one of said ports contacts said expandable material, said expandable material being attached to an end of said plug and confronting one of said ports, in proximity thereto;
said expandable material being dimensioned to have an area less than that of the plug end, such that dry flow may occur through said plug end, and when not contacted by liquid, gas may freely flow past said expandable material from one port to the other and through said plug, but when said expandable material is contacted by the liquid, it expands within a region of the container to block the flow of liquid from one port to the other;
whereby dry gas passed into the container through one of the ports freely flows through the container and emerges from the other port, but liquid entering the container through one of the ports is prevented from exiting through the other port.

4,216,792

PROPORTIONER OF LIQUIDS

Samuel Siminovich, Buenos Aires, Argentina, assignor to Araley, S.A., Buenos Aires, Argentina

Filed Dec. 4, 1978, Ser. No. 966,334
Claims priority, application Argentina, Apr. 26, 1978, 271903
Int. Cl.[2] B67D *1/04*
U.S. Cl. 137—209 2 Claims



1. A proportioner for liquids comprising a hermetically sealed vessel; a liquid feed line, a compressed air line and a liquid discharge line, all of said lines entering through the top of said vessel, said liquid discharge line extending almost to the bottom of said vessel; a check valve and a valve closed by a float, both of said valves located in said liquid feed line for controlling the amount of liquid feed; a solenoid valve in said compressed air line for controlling the input of compressed air; a branch located at mid-height in said liquid discharge line; a flexible tube connected to said branch at its one end; a rod extending through the roof of said vessel and attached to the other open end of said flexible tube, said rod being adapted to be slidably moved in a vertical direction thereby controlling the level of said open end of the flexible tube and determining the amount of liquid to be discharged through said liquid discharge line.

4,216,793

SHUTOFF VALVE

Frank R. Volgstadt, Madison; Albert H. Reschke, Chagrin Falls; David P. Passerell, Geneva, and Raymond A. Day, Seven Hills, all of Ohio, assignors to Perfection Corporation, Madison, Ohio

Continuation-in-part of Ser. No. 811,634, Jun. 30, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 964,811
Int. Cl.[2] F16K *51/00*
U.S. Cl. 137—318 12 Claims

1. A valve for tapping flow from a fluid supply conduit and for controlling the tapped flow without blocking continued flow through the conduit comprising:

a valve body having a mounting area thereon for attachment to a supply conduit;

a first passageway extending through said valve body from an outer end thereof to said mounting area for receiving a penetration member to penetrate the supply conduit and tap fluid therefrom into said first passageway without blocking continued fluid flow through the supply conduit;

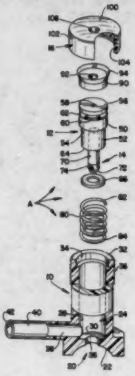
a second passageway communicating with said first passageway between said mounting area and said outer end of said valve body;

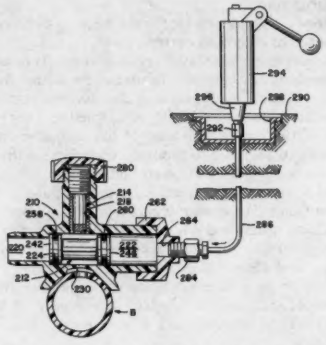
a smooth unthreaded piston receiving passage in said valve body;

a piston positioned in said piston receiving passage in sliding sealing engagement therewith and being movable between an open position providing fluid flow from said supply conduit to said second passageway and a closed position blocking fluid flow to said second passageway;

said piston having one piston end exposed to the pressure in the supply conduit at least in said open position thereof and having an opposite piston end;

connecting means on said valve body for connecting said piston receiving passage with a remote pressure source for selectively providing a positive pressure to said piston





receiving passage at said opposite piston end for moving said piston from said open position to said closed position; and

said piston being movable from said closed position to said open position when the pressure acting on said opposite piston end is reduced below a predetermined value.

4,216,794

IRRIGATION WATER DISCHARGE VALVE

Norman S. Standal, Star Rte., Bliss, Id. 83314

Division of Ser. No. 711,986, Aug. 5, 1976, Pat. No. 4,159,080. This application Oct. 23, 1978, Ser. No. 953,702
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 137—322 6 Claims

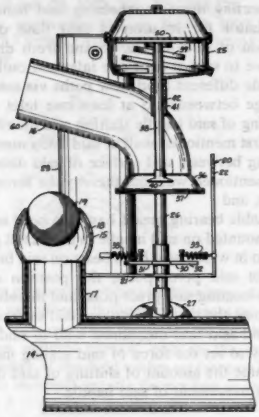
1. A riser valve for an irrigation water supply line that is adapted to be releasably coupled to a pipeline having a coupler which includes: (1) lower riser engaging members having curved engaging surfaces; (2) an upper coupling fluid conduit having a flared terminal end; (3) an annular inner seal mounted at the flared terminal end; and (4) a valve actuating means, said riser valve comprising:

an upright riser having exterior cylindrical walls generated about a central riser axis;

an exterior enlargement stationarily affixed at the upper end of the riser in open communication with the riser interior, said enlargement having (1) a lower exterior diverging spherical surface complementary to the curved engaging

surfaces of the lower riser engaging members and adapted to be engaged thereby and an upper exterior converging spherical surface to be coupled to the fluid conduit with the annular inner seal interposed between the upper exterior converging spherical surface and the flared terminal end of the fluid conduit when the lower riser engaging members engage the lower exterior spherical surface;

wherein the lower and upper spherical surfaces of the enlargement have an exterior radius greater than the exterior radius of the upright riser and wherein the lower exterior



spherical surface of the enlargement intersects the upright riser across a first plane perpendicular to the riser axis at the joinder between the enlargement and the riser;

the upper end of the enlargement having an aperture formed through the upper exterior spherical surface thereof, said aperture being centered about the riser axis and intersecting the upper exterior spherical surface across a second plane perpendicular to said axis; and

movable means mounted within the enlargement for selectively opening and closing said aperture in response to the valve actuating means.

4,216,795

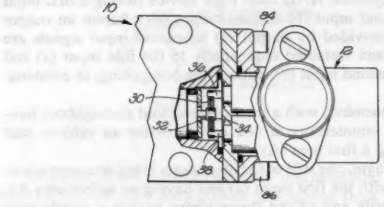
POSITION FEEDBACK ATTACHMENT

Clyde E. Cobb, Lakeview Terrace, and Kim L. Coakley, Castaic, both of Calif., assignors to Textron, Inc., Providence, R.I.

Filed Dec. 26, 1978, Ser. No. 972,766

Int. Cl.³ F15B *13/16*

U.S. Cl. 137—554 **8 Claims**



1. Multi-position attachment between a plurality of transducers and a single driving element for use with an electrohydraulic servovalve comprising:

a rod for attachment to said driving element;

plate means removably centrally attached to said rod; and

link means permanently affixed at each end of said plate means for attachment to said transducer.

4,216,796

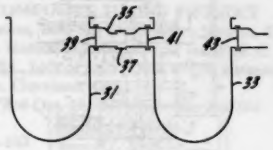
APPARATUS FOR INTERCONNECTING TANKS TO PREVENT OVERFLOWS AND SPILLS

Edward A. Gastrock, Metairie, La., assignor to Charles L. Steward, Glencoe, Ill. and Gastrock Protein Corp., Metarie, La.

Division of Ser. No. 721,203, Sep. 8, 1976, Pat. No. 4,139,646. This application Nov. 13, 1978, Ser. No. 960,094

Int. Cl.² A23J *1/14*

U.S. Cl. 137—571 **3 Claims**



1. Apparatus for interconnecting processing tanks in an in-line liquid process in which the material being processed moves from a tank at the beginning of the process to a tank at the end of the process, said interconnecting apparatus functioning to minimize spills and to direct spillage overflow from the tanks at the end of the process to the tanks at the beginning of the process with the apparatus including:

a plurality of processing tanks located in proximity to one another and connected by processing conduits,

spillage conduits sequentially connecting one process tank to another with said spillage conduits connected to said tanks above the operating level of liquids in the tanks,

at least one dam controlling flow through each spillage conduit between any two tanks,

the effective height of each dam being above the operating level of liquid in the tank and at the level at which spillage of liquid from the tank will occur,

the effective heights of the dam declining in height from the last tank to the first tank in the process to direct the spillage from tank to tank in a cascading arrangement and in a direction opposite to the movement of processing liquid from tank to tank.

4,216,797

LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation of Ser. No. 895,041, Apr. 10, 1978, Pat. No. 4,159,724, which is a continuation-in-part of Ser. No. 635,294, Nov. 26, 1975, Pat. No. 4,153,075. This application Nov. 13, 1978, Ser. No. 960,113

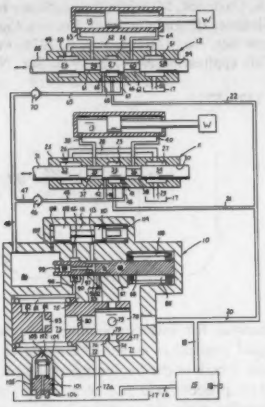
The portion of the term of this patent subsequent to Jul. 3, 1996, has been disclaimed.

Int. Cl.² F15B *13/08*

U.S. Cl. 137—596.13 **14 Claims**

11. A valve assembly comprising at least one housing having an inlet chamber, a load chamber, and exhaust means communicable with reservoir means, first valve means for selectively interconnecting said load chamber with said inlet chamber and said exhaust means, load sensing port means selectively communicable with said load chamber by said first valve means, bypass valve means between said inlet chamber and said exhaust means operable to maintain a relatively constant pressure differential between pressure in said inlet chamber and pressure in said load sensing port means above a certain predetermined pressure level in said load sensing port means said bypass valve means including pilot valve means responsive to pressure differential between pressure in said inlet chamber and pressure in said load sensing port means, and unloading

valve means having means responsive to pressure in said pressure sensing port means and operable to lower pressure in said



inlet chamber when pressure in said load sensing port means is below said certain predetermined pressure level.

4,216,798

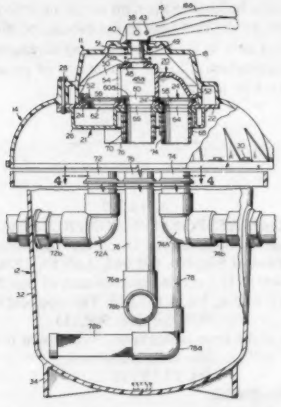
ROTARY VALVE

Georg W. Tscherner, Chateau Guay, Canada, assignor to Coleco Industries, Inc., Hartford, Calif.

Continuation-in-part of Ser. No. 762,490, Jan. 26, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,863

Int. Cl.[2] F16K *11/06*

U.S. Cl. 137—625.29 **15 Claims**



1. In a multiport rotary valve, the combination comprising:

a. a body member providing a chamber therein and having in a wall thereof defining said chamber at least one fluid inlet and at least one fluid outlet opening to said chamber;

b. a fluid distributor mounted in said chamber for relative rotational movement therein, said distributor having a surface dimensioned and configured to extend along said wall and enclose said at least one fluid inlet and outlet, said fluid distributor providing a fluid directing passage opening at said distributor surface;

c. resilient sealing means provided on at least one of said fluid-distributor surface and said wall of said body member;

d. biasing means applying a biasing force to said fluid distributor to press said sealing means between said surface of said distributor and to effect a seal between said distributor surface and said chamber wall, the spacing between said distributor surface and said chamber wall thereby determining the force on said resilient sealing means;

e. an externally accessible handle rotatably and pivotably mounted relative to a wall of said body member opposite said first-mentioned wall for rotation of said handle to and from different positions and for pivoting of said handle about a pivot point;

f. a bearing surface on said valve underlying said handle;

g. connecting means connecting said handle to said fluid distributor for rotation of said fluid distributor, upon rotation of said handle, to and from different positions relative to said at least one inlet and outlet to selectively provide different fluid flow paths via said fluid directing passage between said at least one inlet and outlet, said pivoting of said handle shifting said distributor relative to said first mentioned wall of said body member to vary the spacing between said surface of said distributor and said first mentioned wall and thereby the force on said sealing means; and

h. adjustable bearing means having a head and being adjustably mounted on said handle in a selected position relative thereto in which said head bears on said bearing surface to provide said pivot point, the position of said bearing means locating said pivot point and thereby serving: (1) to determine the spacing between said surface of said distributor and said first mentioned wall of said body member, thereby to set the force of said sealing means, and (2) to determine the amount of shifting of said distributor upon ivoting movement of said handle.

4,216,799

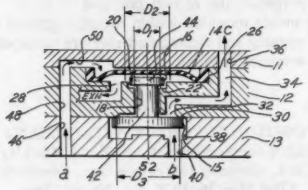
SEQUENTIAL AND FLUID LOGIC DEVICE

Karl A. Brandenberg, Chehalis, Wash., assignor to The Aro Corporation, Bryan, Ohio

Filed Dec. 7, 1978, Ser. No. 967,293

Int. Cl.[3] F16K *11/04, 31/126*

U.S. Cl. 137—625.66 **3 Claims**



1. A sequential AND fluid logic device having a first input (a), a second input (b) and an output (c) wherein an output signal is provided by output (c) whenever input signals are provided and sustained sequentially to the first input (a) and then the second input (b), said device comprising, in combination:

a body member, with a throughbore, said throughbore having a counterbore at one end to define an exhaust seat having a first area (A_1);

a diaphragm, one side of the diaphragm being in communication with the first input (a) and having an active area A_2;

an opposite end of the throughbore having a supply seat with a still larger area (A_3) whereby $A_3 > A_2 > A_1$;

an exhaust passage on the underside of the diaphragm;

an actuator valve having a first valve member cooperative with the exhaust seat;

a poppet for cooperation with the supply seat, said first valve member and poppet being spaced from each other by a rod which is longer than the distance between the exhaust and supply seats; and

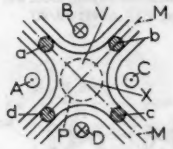
a passage connected to an active side of the poppet and defining the input (b), and a passage from the opposite side of the poppet defining the output (c).

4,216,800

PROCESS AND DEVICE FOR THE CONTROL OF LIQUID METAL STREAMS

Marcel A. Garnier, Grenoble, and Rene J. Moreau, Voiron, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jul. 10, 1978, Ser. No. 923,378
Claims priority, application France, Jul. 12, 1977, 77 21513
Int. Cl.³ F15D *1/00*; B22D *11/16, 27/02*
U.S. Cl. 137—807 **11 Claims**



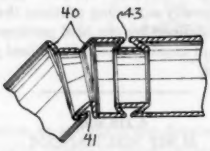
1. A device for centering, guiding and/or imparting a circular section to an unconfined liquid metal stream by subjecting said stream to at least one high frequency multipolar rotating field for creating induced current only in the skin of said stream, the geometry of this field within said stream being such that its amplitude increases greatly from a line or zone toward said skin where it is minimal, so that the longitudinal axis of said stream aligns itself along with said line or zone controlling said stream without using physical walls comprising; a series of at least four electrical field generating means even in number, disposed generally equally along generatrices of a prism or cylinder whose axis, rectilinear or curvilinear, coincides with the longitudinal axis to be imposed on said liquid metal stream, and means for passing, at least during certain periods of time, high frequency alternating currents opposite in direction along two successive field generating means, following the periphery of said prism or cylinder.

4,216,801

FLEXIBLE TUBE

Ardashus A. Aykanian, Wilbraham, Mass., assignor to Flexible Plastic Straw Corporation, Ludlow, Mass.

Continuation of Ser. No. 718,176, Aug. 27, 1976, abandoned. This application Apr. 20, 1979, Ser. No. 31,929
Int. Cl.³ F16L *11/06*; A47G *19/22*
U.S. Cl. 138—121 **8 Claims**



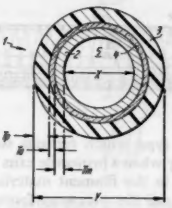
1. In a cylindrical drinking straw of thermoplastic material having a flexible zone intermediate and spaced from the ends thereof, and continuous smooth exterior portions between said flexible zone and each of said ends, said flexible zone being capable of being flexed without substantial springback, the improvement in said flexible zone comprising: a series of circumferential grooves disposed at spaced positions along a longitudinal axis of said drinking straw, each of said grooves being defined by an annular floor inboard of said continuous smooth exterior portions and two opposed convergently extending groove sidewalls, said groove sidewalls terminating on the exterior surface of said straw at positions in alignment with said continuous smooth exterior portions, and a plurality of smooth, annular regions interconnecting the side-walls of each adjacent groove, said smooth, annular regions having the same outside diameter as said continuous smooth exterior portions thereby providing a substantially smooth exterior surface of said straw from end to end.

4,216,802

COMPOSITE TUBING PRODUCT

Eugene D. Bonnes, 7855 Skylineview Dr., Mentor, Ohio 44060; Vijayraj M. Kotian, 4633 Tudor La., and Paul C. MenMuir, 4619 Friar Rd., both of Stow, Ohio 44224, assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 18, 1978, Ser. No. 952,394
Int. Cl.³ F16L *9/14*
U.S. Cl. 138—143 **12 Claims**



1. An elongate deformable tube for use in the conveyance of fluids and/or fluid transmission signals under pressure having a bore therethrough enclosed by a composite annular wall comprising a seamless inner layer made from a metallic material and outer layer made from a polymeric material disposed in encompassing relationship about the inner layer and bonded thereto by means of a polyamide based hot melt adhesive interposed therebetween, said inner and outer layers having annular shaped walls of substantially uniform radial thickness around their circumferences with the outer layer comprising 50% or more of the radial thickness of the total composite annular wall of the tube, and said outer layer having its outer diameter sized during the process of making the tube such that the tube can be attached, without further dimensional alteration, to fittings standardly used to couple equivalently dimensioned tubes having a singular polymeric or metallic wall.

4,216,803

SELF-SEALING FUEL LINES

Charles A. Hall, Lakewood, Colo., assignor to Martin Marietta Corporation, Rockville, N.Y.

Continuation of Ser. No. 696,409, Jun. 15, 1976, abandoned. This application Dec. 14, 1978, Ser. No. 966,216
Int. Cl.² F16L *9/14*
U.S. Cl. 138—144 **7 Claims**

1. A self-sealing structure for handling a fluid comprising a metallic inner member defining a chamber for receiving the fluid, a layer of sealing material disposed in surrounding relation with and spaced from the outer periphery of said metallic inner member for sealing a wound caused by a projectile piercing through the structure, an overwrap disposed directly between and in contact with said metallic inner member and said layer of sealing material for forcing portions of the metallic inner member inward after a projectile exits from the chamber, said overwrap consisting essentially of a plurality of layers of a filament of material extending around said metallic inner member in a state of tension of at least about 2 pounds per 20 ends of material and embedded in a resin matrix, each layer of said filament of material being disposed at a helix angle across the length of the metallic inner member, each succeeding layer of said filament of material being disposed at the same helix

angle but in the opposite direction as the preceding layer and being disposed on top of the preceding layer across the length of the metallic inner member, each of said layers of said filament of material being of a thickness corresponding to the thickness of said filament of material, and said filament of

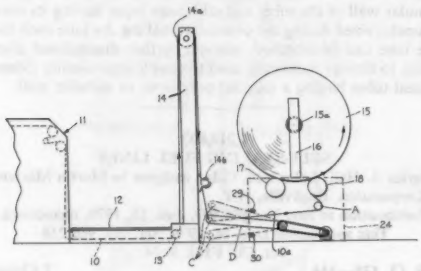
material being of a type which remains substantially elastic until failure, whereby when a projectile exits from the chamber the state of tension in the filament material of each of said layers is maintained and the overwrap forces portions of said metallic member which would otherwise embed in the puncture sealing material back inwardly of said overwrap.

4,216,804

LOOM CLOTH TENSION CONTROL

William J. Alexander, III, Mauldin, and John S. Cooper, Fountain Inn, both of S.C., assignors to Alexander-Cooper, Inc., Mauldin, S.C.

Filed Oct. 2, 1978, Ser. No. 947,413
Int. Cl.[2] D03D *49/20*
U.S. Cl. 139—311 **2 Claims**



1. Loom tension control apparatus for use in a cloth take-up having a motor driving a pair of spaced rolls carrying a cloth roll therebetween positioned in front of a machine from which cloth is delivered in open width to the cloth roll for winding thereon comprising:

means conveying said cloth in at least one substantially horizontal run during its delivery to the cloth roll;

means carrying said cloth on an upward path and a downward path prior to said horizontal run;

a control shaft carried for oscillation in axial alignment with said spaced rolls;

a movable roll supported by said cloth in said horizontal run, said roll being raised and lowered responsive to variations in tension in said cloth;

a pair of transversely spaced arms carrying the movable roll on one end thereof, the other end of said arms having connection with said control shaft for oscillating said control shaft responsive to variations in tension in the cloth in said horizontal run;

motor control means; and

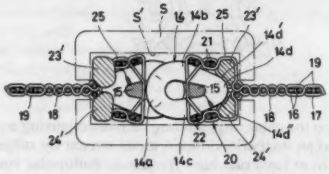
power transmission means connecting said motor control means for operation responsive to the oscillations of the control shaft.

4,216,805

WOVEN FASTENER STRINGER

Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo KK, Tokyo, Japan

Filed Dec. 22, 1978, Ser. No. 972,245
Claims priority, application Japan, Dec. 29, 1977, 52-5391
Int. Cl.[2] A44B *19/40*
U.S. Cl. 139—384 B **3 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads comprising a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section and interengageable with another row on a mating stringer by the action of a slider, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction, and a heel portion remote from said head connected to a next adjacent one of said successive loops; a binding system securing said loops to said filament section and comprising a pair of thermoplastic yarns, one extending longitudinally of said tape in abutting engagement with the upper surface of said heel portion and the other extending longitudinally of said tape in abutting engagement with the lower surface of said heel portion and a binding weft thread continuing from said foundation weft thread and interwoven with said thermoplastic binding yarns, said thermoplastic binding yarns being deformed to assume a compressed configuration in which such yarns each have an outer peripheral surface complementary in shape with respective inner guide walls of said slider and have laterally extending portions that penetrate into respective spaces defined by the heel portions between each adjacent pair of said loops to restrain said heel portions against relative movement.

4,216,806

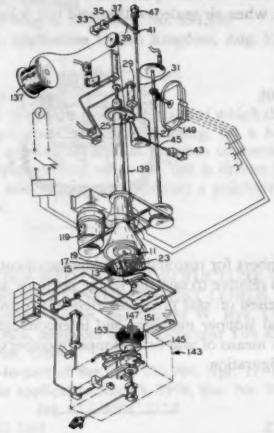
JUMP MECHANISM

Eugene C. Bair, and Alan L. Kindig, both of Holland, Mich., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 6, 1978, Ser. No. 949,268
Int. Cl.[2] B21F *3/04*
U.S. Cl. 140—92.1 **22 Claims**

1. A method of developing at least one coil group comprising a predetermined number of serially connected coils of electrically conductive wire, said method comprising: winding turns of conductive wire, for a first coil of the coil group, about a first step of a coil form having a plurality of different steps thereon; ratcheting a cam device having a plurality of stops thereon to disengage a stop thereof from a follower connected for movement with the coil form; moving the follower into

engagement with another stop of the cam device, and thereby limiting movement of the coil form and locating another step



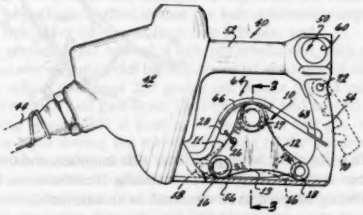
of the coil form in a position for receiving turns of conductive wire for developing another coil of the coil group.

4,216,807

APPLIANCE FOR USE WITH DISPENSING NOZZLES

Edward J. Diamond, 2200 East Ball Rd., Apt. #95, Anaheim, Calif. 92803

Filed Aug. 21, 1978, Ser. No. 935,685
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—392 **1 Claim**



1. In combination, an automatic gas dispensing nozzle of the type having a handle, a guard of inwardly facing channel shape in section and a variable position actuating lever positionable in at least three positions; a substantially planar rigid member of triangular shape with sides of different lengths and the apices of which are at respectively different distances from the sides opposite those apices, each of said apices being defined by a cylindrical enlargement arranged with its axis extending transverse to the plane of said member; and extending laterally on both sides thereof; said member being positioned between said actuating lever and said guard with a selected one of said enlargements engaging said lever and the other two enlargements being seated within the channel of said guard for holding said lever in a selected one of said positions.

4,216,808

CLAW HAMMER

Eric Royce, 122 E. 42nd St., Montclair, N.J. 10017

Filed Nov. 20, 1978, Ser. No. 961,973
Int. Cl.³ B25C *1/00*
U.S. Cl. 145—29 R **2 Claims**

1. A hammer for driving nails into a workpiece, comprising:
(a) an elongated handle;
(b) a hammer head body portion having an upper portion defining a first handle receiving hole and a lower portion defining a second handle receiving hole aligned with said first hammer receiving hole and having a forwardly extending nail driving portion, one end of said handle passing through said first and second holes, said body portion being secured to said handle near said one end of said handle to permit manual gripping and wielding of said hammer at said other end;
(c) nail drawing means extending rearwardly from and being secured at one end to said upper portion of said body portion, whereby the hammer may be used to remove nails from a workpiece; and
(d) support structure integrally secured to and extending from said lower portion of said body portion to the opposite end of said nail drawing means to provide, together with said nail drawing means, a continuous curved structure extending to and from said body portion there being a transverse hollowed-out spaced defined between said upper and lower portions and between said nail driving portion and the nail drawing means and integrally secured support structure such that the spaced upper and lower portions and the spaced nail driving portion and secured nail drawing means and support structure together form a continuous loop which is elongated between the nail driving portion and secured nail drawing means and support structure, an intermediate portion of said one end of said handle extending through the space between said upper and lower portions and between the nail driving means and the secured nail drawing means and support structure and thereby being visible from opposite, transverse sides of said hammer head body portion.

4,216,809

PNEUMATIC TIRE HAVING A RUN-FLAT INSERT STRUCTURE

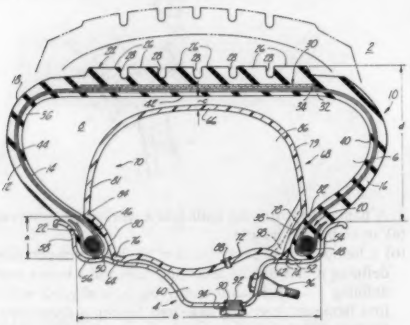
James J. Pixley, Canton, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 14, 1977, Ser. No. 833,108
Int. Cl.² B60C *17/00*
U.S. Cl. 152—158 **2 Claims**

1. In combination with a pneumatic tire and a wheel rim

upon which the tire is supported, said wheel rim having an annular support surface extending laterally in the direction of the axis of the wheel rim and a pair of axially spaced apart annular flanges each connected to and extending radially outward from said annular support surface, the distance between said radially extending annular flanges being the rim width of the wheel rim, said tire having a pair of axially spaced annular beads each in engagement with one of said flanges and the support surface, a pair of sidewalls each connected to and extending generally radially outward from the beads, and a tread connected to the radially outward ends of the sidewalls, said tire and wheel rim forming a closed toroidal cavity:

a generally toroidal shaped, hollow, inflatable insert disposed within said cavity and bearing against said support surface of the wheel rim and having a pair of lateral walls each in engagement with one of the bead regions of the tire, said insert having an interior volume of less than 50% of the volume of said cavity; and



each lateral wall has a radially inward annular wall portion which, in cross section, is concave in the direction of the interior of the insert and a radially outward annular wall portion which, in cross section, is concave in the direction of the exterior of the insert, said radially inward and radially outward annular wall portions being joined together along a circumferential edge between their respective opposed concavities, said circumferential edge projecting a corner in the cross section of said lateral wall, said corner of each lateral wall being located at a distance radially outward of the most radially inward part of the bead region such that the contact of said radially inward annular wall portion with the tire does not extend in a laterally outward direction beyond the rim width, and the radially inward annular wall portions are the only wall portions of the lateral walls in engagement with the tire.

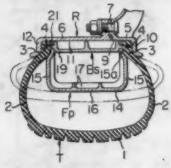
4,216,810

SAFETY WHEEL EMPLOYING A PLURALITY OF PROTECTOR ELEMENTS INTERCONNECTED BY SEPARATE BEAD STOPPER MEMBERS

Isao Osada, Izumi, and Shoichi Sano, Tokorozawa, both of Japan, assignors to Ohtsu Tire & Rubber Co., Ltd., Izumi-ohtsu and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jan. 10, 1979, Ser. No. 2,393
Claims priority, application Japan, Jan. 19, 1978, 53-4583
Int. Cl.[3] B60C *17/04, 5/16*
U.S. Cl. 152—158 **5 Claims**

1. An improved safety wheel apparatus, employing a split rim divided into at least two sections in an axial direction of the wheel, said rim having flange portions formed on its opposite sides and a base portion formed between said flange portions; a tubeless tire mounted in said split rim and having annular bead portions formed on its respective opposite sides; a flat protector of substantially annular configuration, fitted at its inner peripheral surface over the base portion of said rim; said flat protector being comprised of a plurality of circumferentially divided circular protector elements and having at least one side surface arranged in abutting engagment with at least one of said tire bead portions, for supporting the tire tread portion when air sealed within said tire is lost; and bead stop-



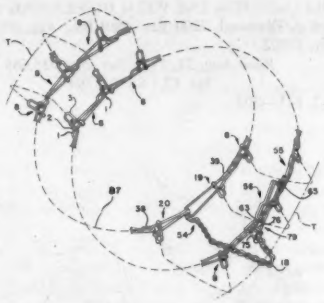
per members for restraining the displacement of said tire bead portions relative to said rim flange portions; said improvement is comprised of: said protector elements formed separate from said bead stopper members and interconnected with one another by means of said bead stopper members, to form a circular configuration.

4,216,811

TIRE CHAIN LINKS AND FASTENING DEVICE

Gorman D. Gray, Rte. 1, P.O. Box 37, Eagle Creek, Oreg. 97022

Filed Sep. 24, 1976, Ser. No. 726,236
Int. Cl.[2] B60C *27/06*
U.S. Cl. 152—213 A **10 Claims**



8. In a tire chain having an inner side member, and outer side member and cross members extending therebetween the tire chain being adapted to be mounted on an automobile tire or the like with the cross members extending around and across the tread of the tire, having means for connecting the ends of the inner side chain together and a binder for connecting one end of the outer side member to the other end of the outer side member, the improved binder comprising;

an eye, adapted to engage the one end of the outer side member;

a slide catch adaped to engage the other end of the outer side member;

a connection bar connecting the eye to the slide catch;

an overcenter slide adapted to dispose the other end of the outer side member to the tightened position; and

an elongated loop enclosing and retaining the other end of the outer side member when disengaged, the eye and the slide catch forming a line, the elongated loop being disposed parallelly to the line and the direction of elongation being substantially opposite the slide catch.

4,216,812
PNEUMATIC TIRE CONTAINING PUNCTURE SEALANTS

Alan J. Bourne, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed Aug. 8, 1978, Ser. No. 931,930

Claims priority, application United Kingdom, Aug. 11, 1977, 33691/77

Int. Cl.² B60C *17/00*

U.S. Cl. 152—330 L **20 Claims**

1. A pneumatic tire to the interior surface of which there has been applied a puncture sealant containing: (a) a lubricant which facilitates relative movement between contacting portions of said interior surface when the tire is driven in a deflated condition, said lubricant comprising a polybutene; and (b) an amide wax.

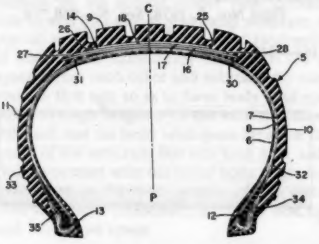
4,216,813
RADIAL TIRE WITH A BELT STRUCTURE OF DIFFERENT REINFORCEMENT CORDS

Theodore M. Kersker, Akron, and Grover W. Rye, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 786,704, Apr. 11, 1977, abandoned. This application May 8, 1978, Ser. No. 904,070

Int. Cl.² B60C *9/18*

U.S. Cl. 152—361 DM **23 Claims**



1. A flat built radial pneumatic tire comprising at least one carcass ply, a tread and pair of sidewalls securing the carcass ply, and a belt structure interposed between the tread and carcass ply, characterized in that the belt structure comprises:

(a) a first layer having at least one belt ply, and

(b) a second layer having a belt ply reinforced with cords made from a material having an initial modulus of elasticity which is at least 250 grams per denier placed radially outward of said first layer, the belt ply of said second layer being elongatable at least as much as said belt ply of said first layer during the torodial shaping of the uncured tire on the building drum, said belt ply of said second layer when the tire is inflated to design inflation pressure and operated at rated load does not contribute substantially to the restrictive force of said belt structure.

4,216,814
BEAD CONSTRUCTION FOR A HEAVY DUTY PNEUMATIC TIRE

Karl A. Grosch, Roetgen, Fed. Rep. of Germany; Henri J. Mirtain; Andre M. Devienne, both of Compiegne, France, and Jean Trzepaez, Thourotte Janville, France, assignors to Uniroyal GmbH, Aachen, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,243

Claims priority, application Fed. Rep. of Germany, May 3, 1977, 7713948[U]

Int. Cl.² B60C *15/04*

U.S. Cl. 152—362 R **2 Claims**

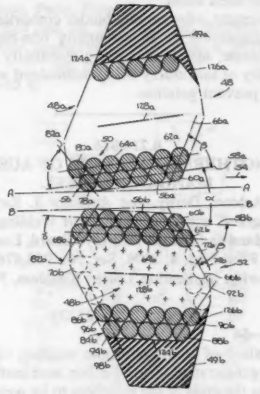
1. A pneumatic heavy service tire for mounting onto an about 5° tapered seat rim comprising:

(a) a pair of bead cores each having a polygonal cross-sectional configuration composed of a plurality of wires, said wires being wound in compact layers in which the centers of the wires in each innermost layer lie along first conical lines having an axially outwardly opening angle α and of approximately 10° with respect to each other and the axially outermost wires in at least two radially innermost layers lie on second lines making an angle of between about 60° to about 85° with said first lines and the axially innermost wires in at least two innermost layers lie along third lines forming an angle of between about 60° to about 120° with said first lines, the cross-sectional configuration of each core being asymmetrical with respect to the mid-axis thereof that lies parallel to each wire layer and parallel to the about 5° tapered seat of the rim when the tire is mounted thereon, each of said bead cores being of a hexagonal cross-sectional configuration and the number of layers in each of said bead cores being equal to the number of wires in the widest layer;

(b) sidewalls;

(c) a carcass of at least one ply of rubberized metallic cord fabric having its end portions wrapped radially around said bead cores to form turnups which are axially displaced from the remaining portions of said carcass; and

(d) an annular apex strip of a hard rubber compound having a substantially triangular cross-sectional configuration



extending radially of and from each of said bead cores and forming a rigid unit with said bead cores.

2. A pneumatic heavy service tire for mounting onto an about 5° tapered seat rim comprising:

(a) a pair of bead cores each having a polygonal cross-sectional configuration composed of a plurality of wires, said wires being wound in compact layers in which the centers of the wires in each innermost layer lie along first conical lines having an axially outwardly opening angle α and of approximately 10° with respect to each other and the axially outermost wires in at least two radially innermost layers lie on second lines making an angle of between about 60° to about 85° with said first lines and the axially innermost wires in at least two innermost layers lie along third lines forming an angle of between about 60° to about 120° with said first lines, the cross-sectional configuration of each core being asymmetrical with respect to the mid-axis thereof that lies parallel to each wire layer and parallel to the about 5° tapered seat of the rim when the tire is mounted thereon, each of said bead cores being of octagonal cross-sectional configuration and the number of layers in each of said bead cores being equal to the number of wires in the widest layer;

(b) sidewalls;

(c) a carcass of at least one ply of rubberized metallic cord

fabric having its end portions wrapped radially around said bead cores to form turnups which are axially displaced from the remaining portions of said carcass; and

(d) an annular apex strip of a hard rubber compound having a substantially triangular cross-sectional configuration extending radially of and from each of said bead cores and forming a rigid unit with said bead cores.

4,216,815

METHOD OF MAKING A CERAMIC SHELL MOLD

Roy C. Feagin, Boca Raton, Fla.

Filed Jul. 3, 1978, Ser. No. 921,832

Int. Cl.³ B22C *1/18, 9/04*

U.S. Cl. 164—26 **12 Claims**

1. In a method for making a shell mold the steps of which consist essentially of:

a. making an expendable pattern of a part to be cast,

b. dipping the expendable pattern into a slurry of a refractory material and a binder to form a moist coating on said pattern,

c. sprinkling a coarse refractory powder on said moist coating,

d. drying said moist coating,

e. repeating steps (b), (c) and (d), whereby said shell mold is built up to a desired thickness,

f. removing the expendable pattern from said shell mold, and

g. firing the shell mold,

the improvement wherein said binder comprises an aqueous, acidic, dispersion of an essentially non-fibrous alumina monohydrate, said binder being essentially free of silica, the acidity of said slurry being maintained at a level sufficient to prevent gelation.

4,216,816

ALUMINOTHERMIC WELDING OF AUSTENITIC MANGANESE STEEL

Michael E. Ashton, Derby, and Anthony J. Key, Upminster, both of England, assignors to Thermit Welding GB Limited, Essex, England and British Railways Board, London, England

Filed Nov. 8, 1978, Ser. No. 958,676

Claims priority, application United Kingdom, Nov. 16, 1977, 47580/77

Int. Cl.² B23K *23/00*

U.S. Cl. 164—54 **8 Claims**

1. In a method of aluminothermic welding of members of austenitic maganese steel to each other, said method comprising preheating the ends of the members to be welded together, forming a refractory mold about said member ends, tapping molten aluminothermic steel into the cavity of said mold and allowing said molten steel to solidify thereby forming a weld joining said members to each other, the improvement which comprises: using (1) austenitic manganese steel which consists essentially of, by weight, 10 to 20% manganese, 0.5 to 1.5% carbon, and 0 to 5% nickel, the balance iron, (2) a particulate mix for forming the aluminothermic steel which mix is substantially free from phosphorus and silicon, and (3) a mold whose body material is predominantly a non-silicon material.

4,216,817

INDUCTOR FOR AN ELECTROMAGNETIC MOLD FOR CONTINUOUS CASTING

Hans-Anton Meier, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

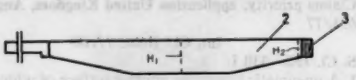
Filed Nov. 29, 1978, Ser. No. 964,616

Claims priority, application Switzerland, Dec. 5, 1977, 14820/77

Int. Cl.³ B22D *27/02*

U.S. Cl. 164—147 **10 Claims**

1. An inductor for an electromagnetic mold for continuous casting of long format rolling metal ingots, said ingots having at least two flat sidewalls running parallel to each other, from molten metal permitting casting of ingots with flat sidewalls which comprises an inductor including at least two substantially flat side walls surrounding said casting having a metallic loop including means for conveying a coolant, said loop having a vertical dimension, wherein the vertical dimension at the middle of the sidewall H_1 of the loop is larger than the vertical dimension H_2 at its corners, wherein the ratio of H_1 to H_2



varies from 1.05 to 2.5, said loop including a transition from said vertical dimension H_1 to said vertical dimension H_2, said inductor compensating for shrinkage which occurs at the sidewall of the ingot and providing ingots which do not suffer from sidewall concavity.

4,216,818

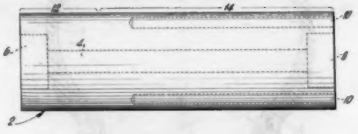
CONTINUOUS CASTING MOLD ASSEMBLY

Robert Wilson, Dundee, Scotland, assignor to Timex Corporation, Waterbury, Conn.

Filed Nov. 8, 1978, Ser. No. 958,774

Int. Cl.³ B22D *11/124*

U.S. Cl. 164—443 **9 Claims**



1. A mold assembly for continuously casting molten metal, comprising:

(a) a mold body having a longitudinal solidification chamber therethrough with an inlet end for receiving molten metal from a molten metal source and an outlet end through which solidified metal exits and having a plurality of longitudinal cooling bores spaced around the solidification chamber, the cooling bores each having an open end on the outlet end of the mold body and extending only partially therethrough toward the inlet end to define an insulating section adjacent said inlet end and a peripheral cooling section adjacent said outlet end, said insulating section extending sufficiently along the length of the mold body to minimize heat removal from the molten metal source and molten metal itself until the metal reaches the cooling section where heat removal is locally concentrated and controlled, and

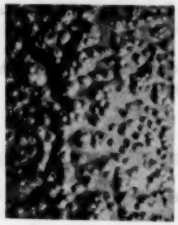
(b) a plurality of elongated closed-end cooling probe means adapted for insertion into the open ends of said cooling bores to provide contact cooling to said peripheral cooling section and moveable into and out of said open ends during casting so as to be adjustable in position along the length of said cooling bores for locally controlling and concentrating heat removal from the molten metal and locating the solidification front within the molten metal at a selected position in the solidification chamber for development of optimum heat transfer and casting surface finish at a given casting speed and molten temperature and chemistry and for reduction of wear of the solidification chamber, if necessary, by periodic repositioning of the solidification front.

4,216,819

ENHANCED CONDENSATION HEAT TRANSFER DEVICE AND METHOD

Frank Notaro, Amherst, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 721,862, Sep. 9, 1976, Pat. No. 4,154,294.
This application Feb. 26, 1979, Ser. No. 15,426
Int. Cl.[2] F28B 9/08
U.S. Cl. 165—1 3 Claims



1. A method for enhanced heat transfer between a first fluid at first inlet temperature and a second fluid at second initial temperature substantially colder than said first inlet temperature in a heat exchanger wherein said first fluid is flowed in contact with a first side of a metal substrate and at least partially condensed by the second colder fluid contacting the opposite side to said first side of said metal substrate, comprising the steps of: providing a single layer of randomly distributed metal bodies each individually bonded to the substrate first side spaced from each other and substantially surrounded by said substrate first side so as to form body void space with the arithmetic average height e of the bodies between 0.005 inch and 0.06 inch and the body void space between 10 percent and 90 percent of the substrate first side total area; and passing said first fluid in contact with the metal body single layer so as to form condensate on the outer portion of said metal bodies and drain the so-formed condensate from said heat exchanger through said body void space.

4,216,820

CONDENSER/EVAPORATOR HEAT EXCHANGER AND METHOD OF USING THE SAME

John E. Andrew, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Apr. 7, 1978, Ser. No. 894,254
Int. Cl.[2] F28B 1/02; F28D 9/00; F28F 9/00
U.S. Cl. 165—1 9 Claims

1. A method of accomplishing heat exchange between a first liquid medium and a second vaporized medium which is to be condensed by being placed in heat exchange relationship with said first liquid medium, said method comprising:

a. providing a heat exchange structure having a heat exchange section with a vertical axis, a horizontal "X" axis, and a horizontal "Y" axis perpendicular to the "X" axis, said heat exchange section comprising a plurality of heat exchange panel units, each of said panel units comprising:

1. a mounting frame lying generally in a plane aligned with the vertical axis and the "X" axis, said mounting frame comprising a perimeter portion and a plurality of spacing elements spaced from said perimeter portion and from one another at generally regular intervals along said "X" axis, each of said spacing elements being vertically aligned and also having a substantial alignment component along said "Y" axis

2. a pair of thin film sheets having inner and outer surfaces, and positioned on opposite sides of said mounting frame, with the inner surfaces of the sheets defining with the frame vertical passageways within the panel unit, said panel units positioned adjacent one another so as to be spaced moderately from one another at generally regular intervals along said "Y" axis, with each adjacent pair of panel units defining a condensing area therebetween,

b. directing a pressurized gaseous medium into the condensing areas between said panel unit,

c. directing a liquid evaporating medium as liquid films onto the upper ends of the inner surfaces of said sheets,

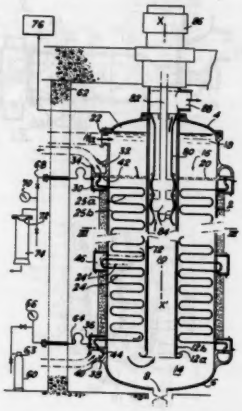
whereby heat exchange is able to take place between said two mediums across said sheets.

4,216,821

PUMP/HEAT EXCHANGER

Marcel Robin, Sevres, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 20, 1978, Ser. No. 870,867
Claims priority, application France, Feb. 4, 1977, 77 03192
Int. Cl.[2] F28F 11/00
U.S. Cl. 165—11 R 17 Claims



1. Pump/heat exchanger assembly having tubes with double walls, inner and outer respectively, the outer wall being provided with inner longitudinal grooves, the said exchange occuring between a primary fluid circulating outside said tubes and a secondary fluid circulating inside said tubes, said assembly comprising:

an outer cylindrical casing with a vertical axis, provided with a base, a lid and an inlet nozzle for the primary fluid arranged below said lid;

an inner cylindrical collar inside said casing and coaxial therewith and integral at its upper end with said lid, said collar defining internally a central vertical channel and externally an annular space between said casing and said collar, said collar defining between itself and the base a passage which communicates between said central channel and said annular space;

a plurality of said double-walled tubes arranged in said annular space, each of said tubes consisting of a plurality of inter-connected tube sections, said tube sections being in

the form of convolutions having horizontal curved portions and elbowed portions, said tube sections being joined together at said elbowed portions.

at least one leakproof annular chamber exterior to said annular space:

a pump fixed to said lid and fitted with a rotor, said pump being located at the upper end of said central channel and adapted to draw in said primary fluid;

means for detecting leaks in said tubes comprising means for injecting an inert gas, under a given pressure, into at least one of said annular chambers, and means for comparing the pressure of said gas in at least one of said chamber with a maximum and a minimum pressure;

said tube sections being connected in said at least one chamber, the end of the outer wall of one section and the start of the outer wall of the next section opening into said chamber, and the end of the inner wall of one tube section being connected to the start of the inner wall of the next section, in leakproof manner, by an elbowed duct.

4,216,822

AIRFLOW DISTRIBUTING DEVICE FOR AUTOMOTIVE AIR-CONDITIONING SYSTEM

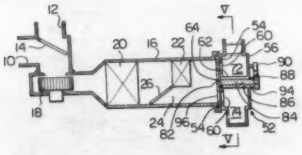
Masao Izumi, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

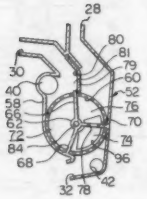
Filed Apr. 18, 1978, Ser. No. 897,917

Claims priority, application Japan, May 20, 1977, 52-65594[U]

Int. Cl.[2] F28C *27/02*

U.S. Cl. 165—42 **16 Claims**





1. An air flow distributing device for use with an automotive air-conditioning system having air cooling means and air heating means, comprising:

a first casing containing therein said air cooling means and said air heating means for cooling and heating the air passing therethrough;

a second casing located at a downstream end of said first casing and having therein first, second and third cells which have respective inlet openings facing the chamber defined in said first casing, said inlet openings being arranged to lie on a common flat plane;

first, second and third ducts which are respectively communicable with said first, second and third cells for providing respective communications between given portions of the passenger compartment and said cells;

a flat plate member having a size to sufficiently cover said inlet openings of said first, second and third cells and lying on said common flat plane to cover said inlet openings, said plate member having an opening and being rotatable about an axis perpendicular to the face of said plate member so that the opening is open to at least one of said inlet openings when said plate member assumes a given angular position; means for selectively taking first and second positions to direct air to said ducts, said first position being a position in which communication with said first cell and said first duct is established and simultaneously communication between said first and third cell is blocked, said second position being a position in which communication between said first duct is blocked and simultaneously communication between said first and third cell is established; and

control means for remotely controlling the rotational movement of said plate member.

4,216,823

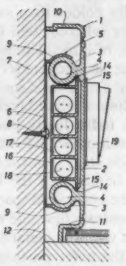
BASEBOARD HEATING APPARATUS WITH CABLE CARRIER

Erik C. V. Keldmann, Bellinge, Denmark, assignor to Elpan ApS, Denmark

Filed Jun. 5, 1978, Ser. No. 912,217

Int. Cl.[2] F24H *9/08*; H02G *3/22*

U.S. Cl. 165—55 **4 Claims**



2. A heating apparatus of the type which is adapted to be mounted as a baseboard along the walls of the room which is to be heated, said apparatus comprising a housing portion consisting of a profiled metal rail having a body plate providing a heat-radiating surface which is vertical in use, said rail being formed with upper and lower integral, inwardly facing, longitudinally extending hollow beads which constitute supply and return channels for the gaseous or liquid medium and said housing further including internal carrying means for longitudinally extending electric cables characterized in that the housing portion further is formed with means for mounting at least one socket for connecting the cables with a plug on a wire leading to a consumption unit.

4,216,824

SPACER FOR REMOVABLE HEAT EXCHANGER TUBES

Richard R. Braun; Glen E. Petaja, and Charles E. Cedar, all of Hibbing, Minn., assignors to L & M Radiator, Inc., Hibbing, Minn.

Filed Mar. 16, 1979, Ser. No. 20,828

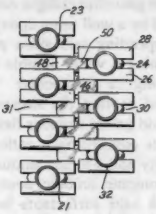
Int. Cl.[2] F28F *9/00*

U.S. Cl. 165—69 **3 Claims**

1. In a heat exchanger having a plurality of individual heat exchange units adapted to cool a fluid passing therethrough, said individual units each comprising an assembly including a plurality of elongated conduits, each conduit having a pair of finned surfaces attached thereto to serve as heat exchanger surfaces with at least some of the conduits being positioned in parallel relation to each other and said finned surfaces extending a substantial distance along at least two sides of the conduits to form at least two parallel channels at opposite sides of said conduits said conduits being spaced apart to provide paral-

lel spaces between adjacent individual heat exchange units, the improved heat exchanger assembly which comprises

(a) a block of temperature and fluid resistant elastomeric material, one end placed into at least one of said channels and the other end placed in said spaces, said block having



a thickness in the dimension to be inserted into said channels and spaces so as to be retained in the channel;

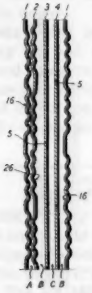
(b) a flange formed on at least one side of the block and extending outwardly of the portion thereof which is inserted in said channels and spaces.

4,216,825

PLATE TYPE EVAPORATOR

Hiroyuki Sumitomo, Amagaski, Japan, assignor to Hisaka Works, Ltd., Osaka, Japan

Filed May 17, 1978, Ser. No. 906,873
Claims priority, application Japan, May 17, 1977, 52-57343
Int. Cl.[3] F28F *13/12*
U.S. Cl. 165—109 R 5 Claims



1. A plate type evaporator characterized in that in a collision jet type plate evaporator: (a) the heat transfer surfaces of the heat transfer plates are formed with a number of grooves which are concentric with the center of collision with which a jet collides; (b) jet holes in the jet plates are circular; and (c) the plane contour of the grooves in the heat transfer plates is circular.

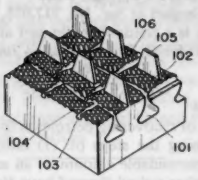
4,216,826

HEAT TRANSFER TUBE FOR USE IN BOILING TYPE HEAT EXCHANGERS AND METHOD OF PRODUCING THE SAME

Jun Fujikake, Yamato-Kooriyama, Japan, assignor to Furukawa Metals Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1978, Ser. No. 881,860
Claims priority, application Japan, Feb. 25, 1977, 52-20084; Feb. 25, 1977, 52-20085; Nov. 25, 1977, 52-143719
Int. Cl.[2] F28F *13/02*
U.S. Cl. 165—133 4 Claims

1. A heat transfer tube for use in boiling type heat exchangers characterized by comprising annular or spiral cavities formed in the tube surface, said cavities becoming narrow from corresponding opposite sides forming narrow gaps at the end of said cavities, where said cavities communicate with the outside space through said narrow gaps, said cavities being



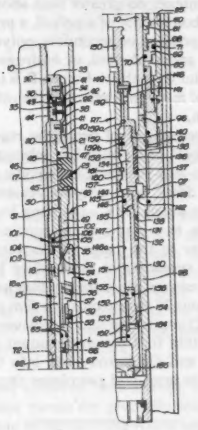
separated by fins having thickened head portions, said head portions having broad upper surfaces, at least a portion of the periphery of said head portions forming the periphery of said narrow gaps.

4,216,827

FLUID PRESSURE SET AND RELEASED WELL PACKER APPARATUS

Talmadge L. Crowe, P.O. Box 3048, Houston, Tex. 77001

Filed May 18, 1978, Ser. No. 907,121
Int. Cl.[2] E21B *33/126, 33/128*
U.S. Cl. 166—120 20 Claims



1. A retrievable well casing packer comprising: an elongated tubular body connectable in a running pipe string; normally retracted slip means on said body and expansible into engagement with the casing; resilient packing means deformable into sealing engagement with the casing; setting means shiftable on said body for expanding said slip means and deforming said packing means including means responsive to the pressure of fluid in said body; locking means acting between said body and said setting means and enabling shifting of said setting means with respect to said body and for holding said setting means shifted following engagement of said slip means and said packing means with said casing and holding said packing means resiliently deformed; said body and said setting means having means for retracting said slip means and allowing relaxation of said packing means upon movement of said body longitudinally relative to said setting means; and release means releasable responsive to fluid pressure in said body for holding said body against said movement.

4,216,828
METHOD OF RECOVERING PETROLEUM FROM A SUBTERRANEAN RESERVOIR INCORPORATING AN ACYLATED POLYETHER POLYOL

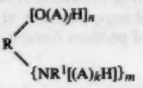
Charles M. Blair, Jr., Buena Park, Calif., assignor to Magna Corporation, Santa Fe Springs, Calif.

Continuation-in-part of Ser. No. 917,055, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 917,057, Jun. 19, 1978, abandoned. This application Jun. 4, 1979, Ser. No. 45,360

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—274 **27 Claims**

5. The method of recovering petroleum from a subterranean reservoir comprising the steps of: (1) introducing into said reservoir a predeterminable amount of an acylated polyether polyol, the polyether polyol thereof have the formula:



wherein:

A is an alkylene oxide group, $-C_iH_{2i}O-$;

O is oxygen;

i is a positive integer no greater than about 10;

j is a positive integer no greater than about 100;

k is a positive integer no greater than about 100;

N is nitrogen;

R^1 is one of hydrogen, a monovalent hydrocarbon group containing less than about C_{11}, or $[A_LH]$;

L is a positive integer no greater than about 100;

R is a hydrocarbon moiety of a polyol, a primary or secondary amine, a primary or secondary polyamine, a primary or secondary amino alcohol, or hydrogen; and

m+n is no greater than about 4 when R is other than hydrogen and one of m and n is zero and the other is unity when R is hydrogen,

said acylated polyether polyol being the reaction product of said polyether polyol and a member selected from the class consisting of mono- and polybasic carboxylic acids, acid anhydrides, and iso-, diiso-, and polyisocyanates, said acylated polyether polyol at about 25° C.: (a) being less than about 1% by volume soluble in water and in isooctane; (b) having a solubility parameter in the range of between about 6.9 and about 8.5; and (c) spreading at the iterface between distilled water and refined mineral oil to form a film having a thickness no greater than about 20 Angstroms at a film pressure of about 16 dynes per cm; (2) contacting said petroleum in said reservoir with an effective thin film forming amount of said acylated polyether polyol; and (3) introducing into the reservoir an injection medium to urge said petroleum through and out of said reservoir

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4,216,829
GELLED WATER EPOXY SAND CONSOLIDATION SYSTEM

Joseph R. Murphey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 840,083, Oct. 6, 1977. This application Dec. 4, 1978, Ser. No. 966,185

Int. Cl.[2] E21B *33/138, 43/04;* C08L *1/26*

U.S. Cl. 166—276 **38 Claims**

1. A process for coating silica particles with epoxy resin in the presence of an aqueous fluid comprising mixing a neutral polysaccharide polymer having a molecular weight of about 100,000–2,000,000 with said aqueous fluid to gel the fluid and said polymer having water solubility sufficient to increase the viscosity of water to at least about 30 centipoise; adding a mixture of surfactants to said aqueous fluid in an amount at least sufficient to coat onto said silica surfaces, said mixture comprising at least one cationic surfactant with limited water solubility and at least one water miscible surfactant which is nonionic, anionic, neutralized cationic or a mixture thereof; mixing said silica particles with said gelled aqueous fluid; mixing said epoxy resin composition with the said gelled aqueous fluid; and coating said epoxy resin composition onto said silica particles suspended in said gelled aqueous fluid by mixing in the presence of said mixture of surfactants.

21. In a process for gravel packing a zone in a subterranean formation intersected by a well using epoxy coated silica particles, the step of suspending said silica particles in a gelled aqueous fluid containing a water soluble neutral polysaccharide polymer having a molecular weight of about 100,000–2,000,000 and coating the suspended silica particles with epoxy resin in said gelled aqueous fluid in the presence of a blend of surfactants comprising a cationic surfactant with limited water solubility and a minor amount of water miscible surfactant which is nonionic, anionic, neutralized cationic or a mixture thereof with said surfactants being present in an amount at least sufficient to coat onto said silica surfaces.

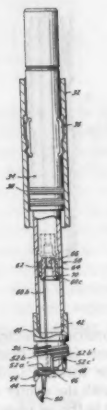
4,216,830
FLAPPER VALVE

John V. Fredd, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 2, 1978, Ser. No. 957,153

Int. Cl.[2] E21B *43/12;* F16K *17/00*

U.S. Cl. 166—319 **16 Claims**



1. A subsurface valve comprising:

body means including flow passage means extending therethrough;

seat means carried by said body means and disposed around said flow passage means;

flapper closure means;

flexible hinge means for pivotally supporting said flapper closure means so that said flapper closure means is movable between an on-seat position engaging said seat means and a full open position pivoted away from said seat means;

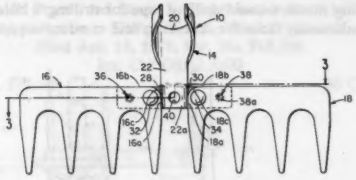
actuator means axially movable with respect to said body means; and

elastic coupling means for operably connecting said actuator means and said flapper closure means.

4,216,831
GOLF CLUB ATTACHMENT FOR RAKING SAND TRAPS AND RETRIEVING GOLF BALLS

David A. Ritchie, Norwood Heights, Annisquam, Gloucester, Mass. 01930

Filed Mar. 23, 1979, Ser. No. 23,144
Int. Cl.[2] A63B *57/00*; A01B *1/00*
U.S. Cl. 172—380 11 Claims



9. A collapsible rake head for removably and replaceably deployably detaching on a golf club shaft and thereby suitable for raking golf course sand traps, said collapsible rake head comprising, in combination

A. a mounting bracket

(1) having a slotted shaft-engageable tubular collar having a central axis and arranged for said deployable attachment with the shaft extending along said axis,

(2) having first and second oppositely-directed blade-mounting tabs disposed symmetrically to one another relative to said collar, and

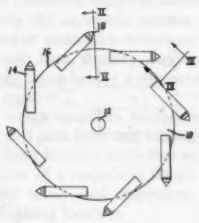
(3) having a bridging member interconnecting said mounting tabs and said collar and providing stepped shoulder surfaces adjacent the interconnection thereof with each said mounting tab, and

B. first and second rake blades, each mounted to the same-numbered mounting tab and rotatable relative thereto between a deployed position, where said blades are aligned one with another along a second axis extending transversely to said collar axis, and a collapsed position rotated substantially a quarter turn from the deployed position.

4,216,832
FURROWING TOOL

Earle W. Stephenson, Latrobe, and Clyde G. Hutzell, Schellsburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 699,491, Jun. 24, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,045
Int. Cl.[2] A01B *33/10*
U.S. Cl. 172—540 5 Claims

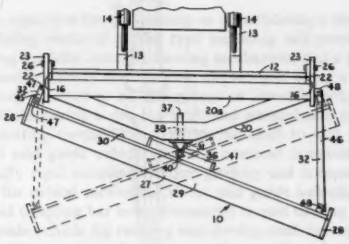


1. A rotary earthworking tool, especially for opening a furrow in a field, comprising; a disc adapted to be driven in rotation and having generally planar sides and a peripheral surface joining said sides, bit elements abuttingly mounted on said peripheral surface and having a forward working portion for engagement with the field surface, recesses formed in said forward working portion, compacts of hard wear resistant material seated in said recesses, said compacts having a rearmost projecting section telescopically engaged in said recesses and a rearwardly facing abutment surface mating with said forward working portion, said bit elements having a slotted portion forming dependent legs and a locating surface on said bit element so that said leg portions engage respective planar sides of said disc and said locating surface abuts said peripheral surface of said disc, said bits being cylindrical with a central axis forming an acute angle with a radius line of said disc and said forward working portion pointing forwardly in the direction of rotation of said disc, said slotted portion formed through the rearward portion of said bit and extending toward said forward working portion.

4,216,833
PLOW BLADE ATTACHMENT

Peter W. Fezatt, P.O. Box 2407; James A. Harvey, Box 1213, and Ronald A. Harvey, Rte. 3, Box 86AA, all of Orofino, Id. 83544

Filed Apr. 27, 1978, Ser. No. 900,412
Int. Cl.[2] F02F *3/76*
U.S. Cl. 172—805 7 Claims



1. A plow blade attachment mountable to a scraper blade carried by a log skidder in which the scraper blade has a front face extending transversely between scraper blade ends; comprising:

carrying frame means having a cross member adapted to engage and bear against the full width of the scraper blade front face between the scraper blade ends, said carrying frame means having spaced outer ends corresponding respectively to the scraper blade ends;

bracket means at the outer ends of the carrying frame means for removably fixing the carrying frame means to the respective scraper blade ends;

a plow blade;

mounting means centered between the outer ends of said carrying frame means for pivotally joining the center of the plow blade to the carrying frame means about a center vertical axis for selective angular adjustment relative to the scraper blade;

and first and second brace means operatively connected between the outer ends of the carrying frame means and said plow blade for selectively fixing the angular position of the plow blade relative to the carrying frame means about said center axis so the plow blade may be angularly oriented and secured to make an acute angle with the scraper blade.

4,216,834
CONNECTING ASSEMBLY AND METHOD

Harold W. R. Wardlaw, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 736,396, Oct. 28, 1976, Pat. No. 4,081,039. This application Mar. 27, 1978, Ser. No. 890,813
Int. Cl.[2] E21B *15/02*
U.S. Cl. 175—7 35 Claims

1. A riser assembly for connecting a marine well operating

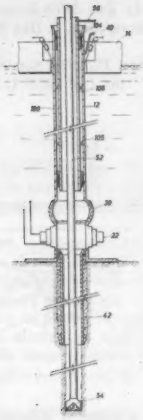
facility with a well site which is submerged in water comprising:

(a) riser tube means having a first end flexibly joined to said operating facility and a second end flexibly joined to said submerged site;

(b) liner means, positioned generally within said riser tube means, having a first end and a second end generally toward said first end and said second end of said riser tube means, respectively;

(c) lower anchoring means for anchoring said liner means to said riser tube means for preventing upward movement of said second end of said liner means relative to said riser tube means;

(d) upper anchoring means for anchoring said liner means to said riser tube means for preventing downward movement



of said first end of said liner means relative to said riser tube means such that said upper and lower anchoring means may cooperate for maintaining said liner means under tension;

(e) seal means for fluid sealing said liner means to said riser tube means generally toward said second end of said liner means, thereby defining a lower end of a generally annular region defined between the radially inner surface of said riser tube means and the radially outer surface of said liner means so positioned within said riser tube means; and

(f) gas input means for selectively introducing gas into said generally annular region for generally increasing the buoyancy of said riser assembly by decreasing the density or the amount, or both, of liuqid in said generally annular region.

4,216,835

SYSTEM FOR CONNECTING AN UNDERWATER PLATFORM TO AN UNDERWATER FLOOR

Norman A. Nelson, 2202 Sieber, Houston, Tex. 77017

Filed Sep. 5, 1978, Ser. No. 939,731

Claims priority, application United Kingdom, Sep. 7, 1977, 37328/77

Int. Cl.[2] E21B *15/02*

U.S. Cl. 175—10 **3 Claims**

1. A handling system for connecting a modular underwater support platform to the underwater floor comprising,

a modular underwater support platform having interconnecting elements for allowing interconnection with additional support platforms,

support means for supporting the support platform, off of the underwater floor,

a conductor pipe for supporting said support platform,

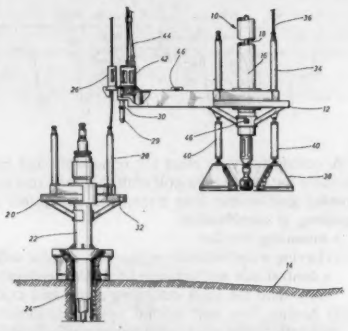
releasable hydraulic connecting means connecting the support platform to the conductor pipe,

a releasable hydraulic latch connector connected to the conductor pipe,

a releasable hydraulic swivel joint connector connected to the latch connector,

a drilling pipe releasably connected to the swivel joint connector for initially supporting said conductor pipe and said support platform in position above the underwater floor,

drilling means on said drilling pipe for drilling a hole in the underwater floor for receiving said conductor pipe,



locking means between the conductor and said support platform which are engaged when the hydraulic connecting means between the platform and the conductor pipe are hydraulically released and the conductor pipe is positioned in the underwater floor hole,

level indicating means on said support platform for indicating the level of the platform whereby the platform may be leveled prior to cementing the conductor pipe in the hole,

a base connected to the bottom of the support platform, and

hydraulic cylinder and piston assemblies connected between the base and the support platform for leveling the support platform.

4,216,836

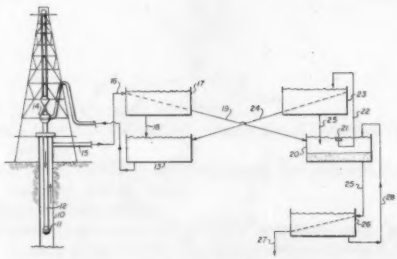
PROCESS AND SYSTEM FOR RECOVERING SOLID PARTICULATE ADDITIVES FROM A DRILLING FLUID

Jerry J. Rayborn, 3633 Inwood Ave., New Orleans, La. 70114

Filed Jan. 27, 1978, Ser. No. 873,085

Int. Cl.[2] E21B *21/00*

U.S. Cl. 175—66 **8 Claims**



1. In a process for drilling a well wherein a drilling fluid containing solid plastic beads having a screen size within the range of 10 to 100 mesh and specific gravity within the range of 0.5 to 2.0, the steps of: (a) separating the drilling fluid flowing from the well into a first fraction consisting essentially of said drilling fluid and a second fraction comprising said beads and cutting from the well, (b) passing the second fraction into

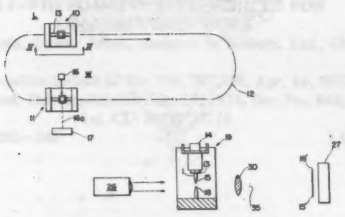
a separating zone containing a liquid having a specific gravity less than the cuttings but greater than the beads and allowing the beads to rise toward upper portion of the liquid while allowing the cuttings to settle therein, and (c) recovering the beads from said separating zone and passing them, along with said first fraction, back to the well to be recirculated therein.

4,216,837

DIFFRACTION OPTICAL WEIGHING SYSTEM

Timothy R. Pryor, and Omer L. Hageniers, both of Windsor, Canada, assignors to Diffracto Ltd., Windsor, Canada

Filed Jun. 14, 1978, Ser. No. 915,384
Int. Cl.[2] G01G *3/00*
U.S. Cl. 177—1 **35 Claims**



1. A method of rapidly weighing items comprising the steps of:

(a) providing a plurality of weigh members, each weigh member comprising means for receiving an item to be weighed and a moveable member, said moveable member comprising a first boundary edge, said moveable member being moveable relative to said weigh member in response to the weight of an item in said receiving means such that said boundary edge moves to an extent dependent upon the weight of said item, said weigh member further comprising a reference member having a second boundary edge said second boundary edge being fixed with respect to said weigh member and spaced from said first boundary edge, said first and second boundary edges defining a gap therebetween, said gap having a size dependent upon the weight of said item;

(b) providing a continuous path for movement of said weigh members in sequence along said continous path, said continuous path including a location for sequentially loading items to be weighed into the receiving means of a respective weigh member and further including a location for determining the weight of an item borne by a weigh member;

(c) loading items to be weighed sequentially into said receiving means of the respective weigh members at said loading location, whereby the moveable member of each respective weigh member undergoes movement in response to the weight of said item, thereby moving said boundary edge and forming a gap having a size dependent upon the weight of said item;

(d) moving said weigh members bearing said items to be weighed along said path from said loading location to said weight determining location such that movement of said moveable member of a respective weigh member is substantially ceased when said respective weigh member reaches said weighing location;

(e) impinging electromagnetic radiation upon the first and second boundary edges of the moveable member of each respective weigh member at said weighing location and producing a pattern of electromagnetic radiation characteristic of said gap in said impinging radiation;

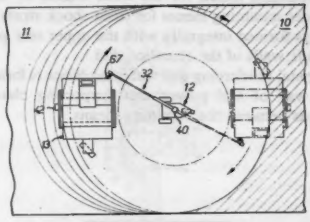
(f) analyzing said produced pattern of electromagnetic radiation to determine the weight of an item borne by each respective weigh member.

4,216,838

COMPACTING APPARATUS FOR ROAD SURFACING MATERIAL

Francois R. Degraeve, Pont Ste-Maxence; Rene G. Divay, Nogent-sur-Oise, and Jean-Pierre E. Lecoeur, Liancourt, all of France, assignors to Albaret S.A., Rantigny, France

Filed Dec. 27, 1977, Ser. No. 864,792
Claims priority, application France, Dec. 28, 1976, 76 39224
Int. Cl.[2] E01C *19/00*
U.S. Cl. 180—14 R **8 Claims**



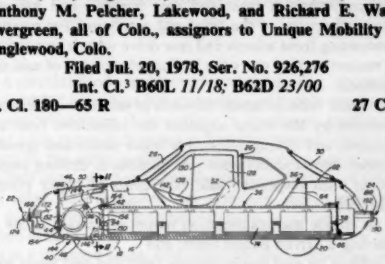
1. In an apparatus for compacting or consolidating a strip of road surfacing material of the type including self-propelled compacting machine having a steering mechanism, and a guide vehicle having a set of drive wheels displaceable along a strip of surfacing material to be compacted or consolidated, said guide vehicle having a driving shaft and transmission means for transmitting torque from said driving shaft to said drive wheels of said guide vehicle; the improvement comprising a substantially rigid coupling bar for guiding said compacting machine for orbital movement about said guide vehicle, one end of said coupling bar being connected to said driving shaft on said guide vehicle for rotating said driving shaft in response to the orbital movement of said compacting machine about said guide vehicle, a crank provided on said compacting machine, the other end of said coupling bar adjacent said compacting machine being articulated to said crank, said crank being coupled to said steering mechanism of said compacting machine for controlling said steering mechanism whereby the radius of the orbital movement of the compacting machine is automatically maintained constant throughout operation.

4,216,839

ELECTRICALLY POWERED MOTOR VEHICLE

John S. Gould, Evergreen; Roger D. Winquist, Golden; William R. Eve, IV, Englewood; James V. McCutchen, Littleton; Anthony M. Pelcher, Lakewood, and Richard E. Watson, Evergreen, all of Colo., assignors to Unique Mobility Inc., Englewood, Colo.

Filed Jul. 20, 1978, Ser. No. 926,276
Int. Cl.[3] B60L *11/18;* B62D *23/00*
U.S. Cl. 180—65 R **27 Claims**



1. An electrically-powered motor vehicle comprising:

a combined body and chassis formed entirely of plastic material and molded and bonded into an integral composite structure;

the structure including a central longitudinal beam, top, bottom, and side panels of the vehicle body portion, and a power unit supporting chamber;

the beam being hollow and generally rectangular in section to serve as a compartment for the vehicle power cells and

extending throughout a major portion of the length of the vehicle, and being closed at its forward end by the rear wall of the power unit supporting chamber, the aft end being openable for the insertion or removal of the power cells;

the bottom panel of the body portion being substantially at the same level as the bottom of the beam and providing a floor in the passenger compartment;

front and rear road wheels mounted by suspension means directly to the plastic structure;

said suspension means for the front wheels of the vehicle includes mounting means for front shock struts and front springs formed integrally with the upper rear portions of the side walls of the chamber; and

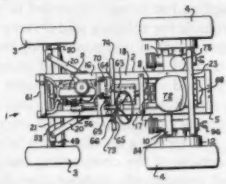
a horizontal reinforcing and stiffening brace is formed in the rear wall of said power unit supporting chamber and extends between the mounting means.

4,216,840

HIGH CLEARANCE VEHICLE DRIVE ARRANGEMENT

Virgil Dick, Rte. 2, Otterville, Mo. 65348

Filed Dec. 7, 1978, Ser. No. 967,278
Int. Cl.[2] B60K *17/06, 17/28*
U.S. Cl. 180—70 R **2 Claims**



1. A drive arrangement for a high clearance vehicle comprising:

(a) an elongate mobile frame having depending laterally spaced struts at front and rear portions and means on lower portions of the front and rear struts for rotatively mounting front wheels and rear drive wheels respectively;

(b) respective ring gears fixed relatively to each of said drive wheels;

(c) a speed reducer means for each of said rear drive wheels carried by the frame adjacent the respective rear drive wheels and having respective input shafts and speed reducer output shafts with gear pinions in driving engagement with respective said ring gears at upper portions thereof;

(d) an engine and transmission mounted on said frame and having a driven output shaft; and

(e) pulleys on said driven output shaft and said input shafts operatively connected by belts for driving the speed reducer means and rear drive wheels in response to operation of the engine;

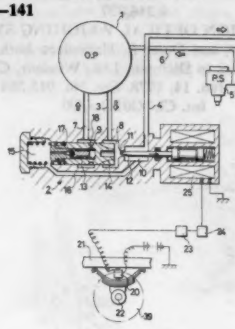
(f) said transmission comprising change speed transmission means driven by said engine, a drive shaft extending from said change speed transmission means, and a speed reducing transfer case having an input shaft connected to said drive shaft, said driven output shaft extending forwardly from said transfer case.

4,216,841

STEERING POWER CONTROL DEVICE FOR POWER STEERING

Tadao Ohtuka, Saitama; Takeshi Ohe, Higashimatsuyama, and Kunihiro Hamano, Tokigawa, all of Japan, assignors to Jidosha Kika Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,074
Int. Cl.[3] B62D *5/08*
U.S. Cl. 180—141 **11 Claims**



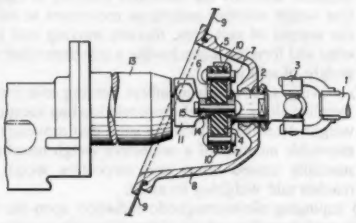
1. In a steerable vehicle having a steering wheel, a steering power control device for a power steering system which comprises an oil pump, a power steering apparatus which exerts an auxiliary force to the steering power of the steering wheel, a vehicle load sensing means which produces an output in response to a vehicle load, a flow control means connected for actuation in response to the output of said vehicle load sensing means, said flow control means being connected between said oil pump and said power steering apparatus, said flow control means comprising a throttle valve mechanism which throttles the fluid passage connected from said oil pump to said power steering apparatus and a recycle passage which returns excess fluid from said flow control means to said oil pump so that the flow rate of the fluid which is supplied to said power steering apparatus from said oil pump is increased by said flow control means when said vehicle load is large.

4,216,842

ANTI-GURGLE APPARATUS FOR A POWER-STEERING VALVE

Georges Decouzon, Guyancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 14, 1978, Ser. No. 942,309
Claims priority, application France, Sep. 29, 1977, 77 29260
Int. Cl.[2] B62D *5/06*
U.S. Cl. 180—146 **5 Claims**



1. An anti-gurgle apparatus for a power-steering valve interposed between an axle of the power-steering valve and the steering column of an assembly which comprises:

a housing connected to said steering column and said power-steering valve;

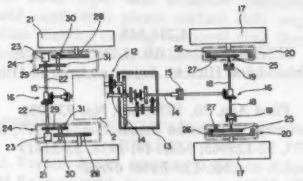
a cover;
a disk of rubber disposed between said housing and said cover;
fastening means interconnecting said cover with said housing;
a clamp member including at least two tabs which engage said axle of said power-steering valve;
a plurality of pin members separate from said fastening means, a first end portion of which respectively fixedly interconnect each of said tabs with said disk or rubber; and
a support element connected to a second end portion of each of said plurality of pin members for supporting said second end portion.

4,216,843

ALL-WHEEL-DRIVE TYPE VEHICLE FOR CONSTRUCTION WORK

Akio Fukata, Izumi, Japan, assignor to Kubota, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 787,398, Apr. 14, 1977, abandoned. This application Sep. 15, 1978, Ser. No. 942,526
Int. Cl.² B60K *17/16*
U.S. Cl. 180—245 **1 Claim**



1. An all-wheel-drive vehicle for construction work, comprising a pair of front wheels, a pair of rear wheels, one of said pairs of wheels being dirigible and the other of said pairs of wheels being non-dirigible, an engine located over the non-dirigible wheels, respective drive axles for the dirigible and the nondirigible wheels, the drive axle for the dirigible wheels being coaxial with the axis of said dirigible wheels, means interposed between the engine and the axles for transmitting power from the engine to the axles, respective reduction gearing means interposed between the axles and the wheels for transmitting power from the axles to the wheels, each of the reduction gearing means for the dirigible wheels including inscribed gearing and each of the reduction gearing means for the non-dirigible wheels comprising a circumscribed gear fixed to the wheel to rotate therewith, a circumscribed gear fixed to the axle to rotate therewith and circumscribed idler gear means meshing with the gear fixed to the wheel and the gear fixed to the axle, the gear fixed to the wheel being located below and the gear fixed to the axle being located above the idler gear means.

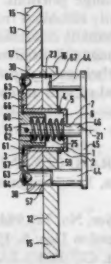
4,216,844

FITTING FOR JOINTS OF LADDER SECTIONS

Ulrich Klafs, Weilheim, Fed. Rep. of Germany, assignor to Zarges Leichtbau GmbH, Weilheim, Fed. Rep. of Germany

Filed Jul. 20, 1978, Ser. No. 926,275
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1977, 2732654
Int. Cl.² E06C *7/50*; E05D *11/10*
U.S. Cl. 182—104 **10 Claims**

1. A fitting for a joint for pivotally interconnecting two ladder sections and automatically interlocking the same in at least one angle position, which includes: a first fitting part and a second fitting part, a joint pivotally interconnecting said first and second fitting parts to each other for pivoting about a common axis, said first and second fitting parts respectively being connectable to the upper ends of two ladder sections, a locking unit associated with said first fitting part and comprising locking pin means, said second fitting part being provided with at least one bore for each angle position with regard to said first fitting part, a guiding pin having its axis coinciding with said common axis, manually operable means of said locking unit connecting said guiding pin to said locking pin means, and spring means associated with said guiding pin and continuously urging said locking pin means toward said second fitting part so as to move said locking pin means into said at least one



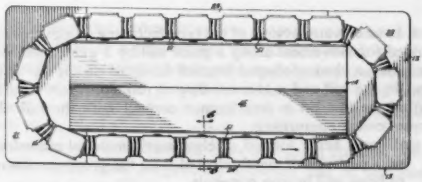
bore in response to the alignment of the latter with said locking pin means, said locking unit being operable against the thrust of said spring means to withdraw said locking pin means from the respective bore aligned therewith, and a locking mechanism to hold the locking unit in its unlocked position until, after one fitting part has pivoted relative to the other fitting part, being held by arc sections between the bores of said second fitting part in its unlocked position.

4,216,845

CIRCULAR FOOD SERVICE CONVEYOR

Philip Tashman, and Vito M. Onori, both of 7500 NW. 41 St., Miami, Fla. 33136

Filed Aug. 17, 1978, Ser. No. 934,345
Int. Cl.² B65G *15/02*
U.S. Cl. 186—49 **11 Claims**



1. A circular food service conveyor comprising, in combination, a table top, means for supporting said table top in vertically spaced relation above a floor, a continuous tracking slot in said table top and disposed in laterally spaced relation with respect to the outer peripheral edge thereof, a conveyor belt loop, said conveyor belt loop comprising a plurality of substantially rigid, flat, elongated slat members, means articulating said slat members in longitudinal edge to longitudinal edge relation in such manner that they are capable of arcuate movement in a common plane, said conveyor slat articulating means comprising central, downwardly-extending support means integrally formed with each of said slat members and a continuous drive chain interconnecting said slat support means, said downwardly-extending slat support means together with said continuous drive chain being receivable in said table top tracking slot so that the remainder of said articulated conveyor slat members will be seated upon the upper surface of said table top for circuitous movement therealong, rotary drive means engagable with said drive chain for moving said articulated conveyor belt along said table top tracking slot, said rotary drive

means comprising a drive gear intermeshed with said drive chain, and means for releasably locking the conveyor slat connected to said drive chain portion intermeshed by said drive gear in said tracking slot to constrain said slat to tracking movement therealong, said releaseable conveyor slat locking means comprising a pair of laterally-outwardly-extending, opposed flange portions integrally formed with the downwardly-extending support means of each of said slat members, and a pair of lock bars moveable between a first position at which they overlie, respectively, upper surface portions of said outwardly-extending flange portions, and a second position whereat they are laterally removed from such overlying positions, resilient means normally constraining said locking bars in said first position, and manually controllable means for temporarily moving them to their second position to enable upward withdrawal and removal of said articulated conveyor.

4,216,846

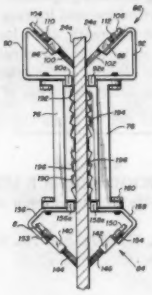
ELEVATOR RAIL CLEANING SYSTEM

John H. Wheeler, Dallas, Tex., assignor to The Texacone Company, Dallas, Tex.

Continuation-in-part of Ser. No. 721,984, Sep. 10, 1976, Pat. No. 4,089,137. This application Dec. 8, 1977, Ser. No. 858,640

Int. Cl.[2] B66B *7/12*

U.S. Cl. 187—1 R **16 Claims**



1. In an elevator system of the type including an elevator car guided for movement along a guide rail by a guide assembly including a channel-shaped bracket mounted on the car adjacent to the rail and a channel-shaped resilient insert secured within the bracket in interference contact with the rail, the improvement comprising:

said insert being formed of elastomeric material embedded with particles of metal selected from the group consisting of brass and bronze materials;

said insert having a working surface with spaced apart side portions connected by an end portion; and

at least one of the side working surface portions of said insert including a plurality of ribs and intermediate troughs of generally V-shaped cross section inclined relative to the longitudinal axis and toward the side surface of the guide rail to channel away loose material cleaned from the rail by the insert during operation of the car.

4,216,847

LIFT TRUCK CONTROL

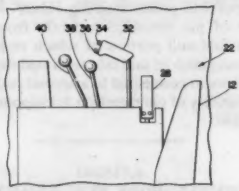
Bernard W. Jalbert, Richboro; Gerald W. Skulley, Doylestown, and James A. Wahl, Langhorne, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 11, 1978, Ser. No. 950,492

Int. Cl.[2] B66B *9/20*

U.S. Cl. 187—9 R **12 Claims**

1. In an electric lift truck having a drive motor, a load lifting carriage, a hydraulic system for operating the load lifting carriage, an electrical control system for controlling the speed and direction of the drive motor, first drive motor control means operatively connected to said electrical control system and movable to select forward or reverse direction and to infinitely vary the speed of said drive motor, lift control means operatively connected to said hydraulic system to control



lifting of said load carriage, and second drive motor control means located on said lift control means and operable to select at least one predetermined drive motor speed and one drive motor direction independent of the first drive motor control means.

4,216,848

CENTRIFUGAL BRAKING DEVICE

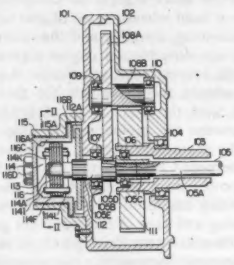
Toyohisa Shimodaira, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 30, 1978, Ser. No. 937,981

Claims priority, application Japan, Sep. 6, 1977, 52-106274; Oct. 19, 1977, 52-125965; Mar. 18, 1978, 53-31419

Int. Cl.[2] F16D *67/02*

U.S. Cl. 188—71.2 **10 Claims**



1. A centrifugal braking device comprising:

a shaft to be braked;

centrifugally activated members mounted on said shaft for rotation and adapted to project outwardly when the rotational speed of said shaft reaches a predetermined level; and

a brake shoe means with which the centrifugally activated members are brought into contact when the latter project outwardly;

wherein the improvement comprises:

fixedly stationary supporting means for supporting said brake shoe means in a stationary condition in such a manner that said supporting means allows said brake shoe means to be rotated by the force of friction produced by contact with said centrifugally activated members and rotation of said brake shoe means in the same direction as said shaft to be braked causes axial movement of said brake shoe means; and

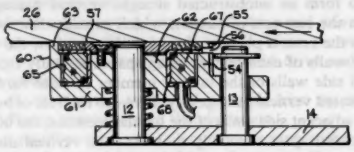
a braking surface means with which the brake shoe means comes into contact as the latter moves axially so as to apply the brake to said shaft.

4,216,849

ELECTROMAGNETS FOR BRAKES AND CLUTCHES

Daniel L. Neill, Belleville, Mich., assignor to Kelsey Hayes Co., Romulus, Mich.

Filed Jun. 12, 1978, Ser. No. 914,474
Int. Cl.[3] B60T 7/12
U.S. Cl. 188—138 14 Claims



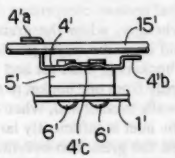
1. In an electric brake system having an armature rotating relative to an electromagnet whereby said brake system is actuated by magnetic engagement between the electromagnet and said armature, an improved electromagnet comprising an electrical coil for magnetically energizing the electromagnet, a first pole enclosed within said coil, a second pole circumscribing said coil, said second pole having a continuous planer armature engaging surface, an aperture opening in said second pole spaced away from said armature engaging surface whereby said continuous planer surface fully engages said armature plate thereby causing frictional drag therebetween and effecting actuation of the brake mechanism.

4,216,850

RETURN SPRING RETENTION FOR A VEHICLE DRUM BRAKE

Ziro Kizaki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation of Ser. No. 845,612, Oct. 26, 1977, abandoned.
This application Jan. 11, 1979, Ser. No. 3,249
Claims priority, application Japan, Jun. 13, 1977, 52-69653
Int. Cl.[2] F16D 51/20
U.S. Cl. 188—216 3 Claims



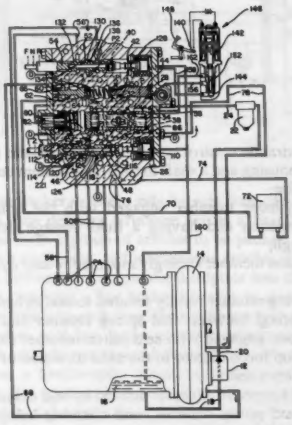
1. In a drum brake for vehicle use including:
a stationary backing plate;
a pair of brake shoes slidably attached to said backing plate;
a wheel cylinder secured on said backing plate between first mutually closely positioned end portions of said shoes;
an anchor secured on said backing plate between second mutually closely positioned end portions of said shoes, said anchor having an anchor block on which each of said second end portions of said shoes abuts and an anchor bracket secured on said anchor block; and
a substantially U-shaped return spring engaged at each end portion thereof with a respective one of said shoes for biasing both said shoes in a mutually approaching direction and having a central U-shaped curved portion,
an improvement wherein said anchor bracket is integrally formed with supporting portions formed as a pair on respective lateral ends thereof as respective bent portions, each of L-letter shape in a departing direction from said backing plate, one of said pair of supporting portions being spaced from said backing plate a given distance and forming one restricting surface on its inner side, and the other of said pair of supporting portions being spaced from said backing plate at a distance less than said given distance for forming another restricting surface on its outer side in order to support said spring from either side thereof with a small gap, in cooperation with said one supporting portion, at non-aligned locations, whereby movement of the spring is restrained within a small limitation in a perpendicular direction to a plane including the central U-shaped curved portion, but freely movable in a parallel direction to this plane.

4,216,851

TRANSMISSION CLUTCHES WITH FULLY-RESETTING MODULATOR-LOAD-PISTON

Probir K. Chatterjea, Mount Prospect, Ill., assignor to International Harvester Company, Chicago, Ill.

Division of Ser. No. 693,469, Jun. 7, 1976, Pat. No. 4,135,610.
This application Mar. 24, 1978, Ser. No. 890,002
Int. Cl.[2] B60K 41/02
U.S. Cl. 192—4 A 10 Claims



1. A rate of rise hydraulic system having a connection to individual lines of a piston-type, transmission-clutch group, wherein the fluid output of the system undergoes pressure loss to an actual clutch fill pressure in order to pass from said connection through said individual lines to reach a selected clutch piston, said hydraulic system comprising:
a clutch pressure modulating valve and signal pressure control means both reciprocally mounted and in opposite ends of a bore (34) formed by a valve housing, said clutch pressure modulating valve being arranged to afford flow of the system fluid output to said connection, out of pumped fluid supplied thereto from a pump source;
said signal pressure control means comprising a dump valve member (174) reciprocally movable in an open-dump direction in toward, and in a closed-seated direction outwardly from, the adjacent end of the bore, and a differential pressure chamber defined between and by the dump valve member and said bore end and receiving system-output-fluid from said connection;
said dump valve member cooperating with modulator loading means in said bore to define a signal pressure chamber;
a selector valve member 48 disposed in said housing at said connection having spool valve portions effective in progressive selector valve positions for cooperating with said individual lines to direct system fluid output to selected ones of the clutch pistons; and
first (186) and second (122) means of connection from the dump valve member and selector valve member, respectively, utilizing system fluid output therefrom to supply

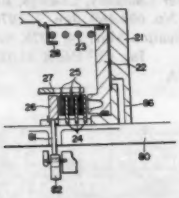
rising signal fluid pressure to the fluid inside the signal pressure chamber.

4,216,852

HYDRAULIC CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS OF MOTOR VEHICLES

Fumihiro Ushijima, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 593,497, Jul. 7, 1975, Pat. No. 4,083,442.
This application Jan. 26, 1978, Ser. No. 872,541
Claims priority, application Japan, Oct. 22, 1974, 49/121720
Int. Cl.[2] F16D *19/00*
U.S. Cl. 192—85 AA **11 Claims**



1. A hydraulic control system for an automatic transmission having a housing and a shaft therein, said system comprising, in combination:

(a) a cylinder member engaged with the housing of the transmission and having a fluid passage defined therethrough;

(b) a piston member slidingly mounted in said cylinder member;

(c) a spring retainer rigidly secured to said cylinder member;

(d) a spring, between said spring retainer and said piston member, engaged with said piston member for applying a reaction force thereto in the axial direction of the shaft of the transmission;

(e) a fluid pressure chamber defined by said cylinder member and said piston member, said chamber being connected with said fluid passage;

(f) a reaction member loosely fit and rotatable within a predetermined angular limit relative to said cylinder member;

(g) a first friction element between said reaction member and said piston member and slidably engaged in the axial direction of said transmission with said cylinder member; and

(h) a second friction element adapted to engage said first friction element and slidably engaged with a friction element carrying member connected to said shaft, said reaction member detecting the direction of rotation of the friction element carrying member when said first and second friction elements are engaged with each other to thereby control the fluid pressure to be supplied to said fluid chamber.

4,216,853

GRAIN RETARDER

James L. Poff, Coatesville, Ind., assignor to Bryant-Poff, Inc., Coatesville, Ind.

Filed Jan. 26, 1979, Ser. No. 6,652
Int. Cl.[2] B65G *11/20*
U.S. Cl. 193—32 **4 Claims**

1. A grain retarder adapted to form a portion of a vertically downwardly extending grain discharge chute comprising a vertically extending tubular member of uniform rectangular cross section having an inlet at its upper end and an outlet at its lower end, two sets of horizontally opposed buckets of rectangular cross section mounted within the tubular member on opposite end walls thereof, the buckets in one set being staggered vertically relative to the buckets in the other set, each of said buckets having an open upper end and a downwardly sloping bottom wall, said bottom wall having an aperture at the lowermost portion thereof substantially smaller than the open upper end of the bucket through which grain is adapted to gravitate and discharge as the bucket fills with grain, the adjacent edges of the opposed buckets being spaced apart laterally so as to form an unobstructed straight vertical passageway between the two sets of buckets which extends downwardly through the central portion of the tubular member, the opposite side walls of each bucket being spaced laterally from the adjacent side walls of the tubular member so as to form two unobstructed vertical passageways between each set of buckets and the adjacent side walls of the tubular member, the buckets being spaced apart vertically such that the vertical distance between vertically adjacent buckets is not substantially less than the lateral distance between the inner edge of a bucket and the end wall of the tubular member opposite thereto, the major portion of the cross sectional area of the tubular member when

viewed in horizontal section comprising the open upper ends of said buckets, whereby, when the grain is directed downwardly through said inlet, the major portion thereof is caught by the uppermost buckets in each set and then gravitates successively downwardly from one bucket to the next through the apertured bottom walls thereof and, when the amount of grain directed through the inlet is sufficiently large in relation to the size of the apertures, the grain also overflows the upper edges of the buckets and cascades downwardly at an angle to the vertical axis of the tubular member successively between the vertically adjacent buckets of the opposed sets and between each set of buckets and the adjacent side walls of the tubular member, the path of travel of said angularly downwardly cascading grain intersecting the path of travel of the grain tending to flow downwardly in said passageways parallel to the vertical axis of the tubular member, whereby the downward velocity of all the grain is substantially reduced relative to its free fall velocity without substantially diminishing the grain flow capacity of the tubular member.

4,216,854

FEEDING APPARATUS WITH ENGAGED/DISENGAGED TRANSPORT MECHANISM

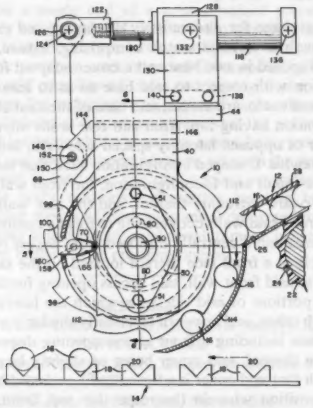
John W. McCoy, West Milford, N.J., assignor to Avon Products, Inc., New York, N.Y.

Filed Jul. 13, 1978, Ser. No. 924,224
Int. Cl.[2] B65G *29/00*; B62C *7/02*; F16D *67/02*
U.S. Cl. 198—481 **12 Claims**

1. A transport mechanism adapted for use in a conveyor line for transporting articles seriatim and in continuous flow from an upstream conveyor to a downstream conveyor comprising

(a) a drive member,
(b) means for driving said drive member continuously,
(c) a driven member,
(d) transport means carried by said driven member for moving the articles over a laterally adjacent article supporting means,
(e) a shaft for supporting both said drive and driven members for rotation,
(f) clutch means acting between said drive and driven members for transmitting torque to said driven member, said clutch means normally engaging said drive and driven members,
(g) an annular rail supported on said drive member and defining a circular race therebetween,
(h) a gate formed in said rail, communicating with said race,
(i) a notch carried by said driven member, and
(j) means cooperating with both said drive and driven members to engage said clutch, said cooperating means including
(l) a lever having means adapted for riding on said rail and for entering into said notch when said riding means passes through said gate
whereby said drive member continues to rotate and said driven member is arrested in movement.

11. A conveyor apparatus including a first conveyor for



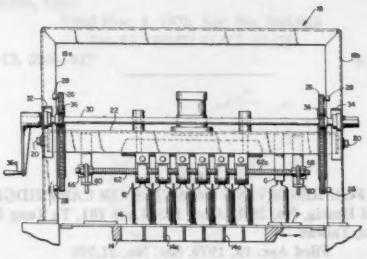
conveying articles to a pick-up location, a second conveyor for receiving articles seriatim, and a transport mechanism for transporting articles from said first to said second conveyor, said transport mechanism comprising
(a) a drive member,
(b) means for driving said drive member continuously,
(c) a driven member,
(d) a transport means carried by said driven member for moving the articles over a laterally adjacent article supporting means,
(e) a shaft for supporting both said drive and driven member for rotation,
(f) clutch means acting between said drive and driven members for transmitting torque to said driven member, said clutch means normally engaging said drive and driven members,
(g) an annular rail supported on said drive member and defining a circular race therebetween,
(h) a gate formed in said rail, communicating with said race,
(i) a notch carried by said driven member, and
(j) means cooperating with both said drive and driven members in response to a low level of articles on said first conveyor to disengage said clutch, said cooperating means including
(l) a lever having means adapted for riding on said rail and for entering into said notch when said riding means passes through said gate
whereby said drive member continues to rotate and said driven member is arrested in movement to discontinue transport of said articles to said second conveyor.

4,216,855

LINE BRAKE ASSEMBLY FOR CASE PACKER

John L. Raudat, Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.

Filed Oct. 27, 1978, Ser. No. 955,489
Int. Cl.² B65G *47/26, 47/88*
U.S. Cl. 198—633 **10 Claims**



1. In a case packer wherein side-by-side lines of articles are fed between lane defining structure across a fixed deadplate into a grid to form a group of articles to be packed upright in a packing case or the like, and wherein the articles are continuously urged downstream across the deadplate into the grid by line pressure requiring a line brake assembly to clamp at least the endmost article in each lane during the packing phase, the improvement to said line brake assembly comprising a fixed frame, with upright portions defining vertically extending guide means, a horizontally extending cross beam slidably received on said guide means, means for clamping said cross beam to said upright portions, a fluid motor with a fixed part secured to said cross beam and a movable part reciprocable with respect thereto, bracket means defining a horizontally extending guideway, which bracket means is mounted for limited vertical movement with reference to said cross beam and which is connected to said movable fluid motor part, a plurality of article engaging brake subassemblies clamped to selected locations on said guideway defining bracket means, and an article height gage block secured to said cross beam to permit locating said cross beam with said gage block in contact with the top of a sample article having a size representative of the articles to be packed the sample article being provided on a reference portion of the deadplate in so locating said cross beam.

4,216,856

REINFORCEMENT FOR ELASTOMERIC ARTICLES

Peter L. E. Moring, Sutton Coldfield, and Ian Biggs, Birmingham, both of England, assignors to Dunlop Limited, London, England

Continuation of Ser. No. 665,417, Mar. 10, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,570
Claims priority, application United Kingdom, Apr. 25, 1975, 17174/75
Int. Cl.² B65G *16/30*; B32B *5/12*
U.S. Cl. 198—847 **48 Claims**

1. A conveyor belt reinforced by a reinforcement strip comprising a multiplicity of closely-packed mutually parallel filaments extending in the direction of the length of the conveyor belt, said filaments being arranged in a two-dimensional array and embedded in a matrix of flexible polymeric material which coats and bonds to substantially each individual filament and

provides a peel-adhesion of at least 3.15 KN/m when tested as defined herein, said matrix of flexible polymeric material prior

to coating and bonding to said filaments having a viscosity of less than 20,000 centipoises measured as defined herein and a tensile strength of at least 10 MN/m^2 in the assembled strip.

4,216,857

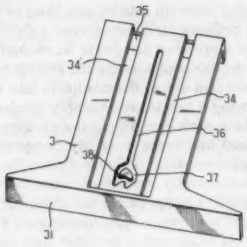
BOX FOR RESERVING CASSETTE OR CARTRIDGE

Lung-Fei Huang, No. 28-1, Alley 113, Lane 181, Ta Tung Rd., Tainan, Taiwan

Filed Apr. 19, 1979, Ser. No. 31,595

Int. Cl.[2] **B65D** *55/02, 85/62*

U.S. Cl. 206—1.5 **3 Claims**



1. A box for reserving an encased magnetic recording tape, comprising:

a shield having rails and flanges positioned on its top wall, said rails and flanges corresponding to channels and concavities on its bottom wall, said bottom wall having a hole therein, said shield further comprising a back wall and side walls interconnecting said top and bottom walls, said side walls having flat outer surfaces;

a drawer insertable within said shield, said drawer providing a space for reserving said encased magnetic recording tape, said drawer having a front wall for covering an open end of said shield, a rear wall, and a bottom bed portion, said bed portion having a groove on its underside;

a spring positioned between said back wall of said shield and said rear wall of said drawer; and

a steel ball being positioned partially within said hole and partially within said groove, wherein when said drawer is inserted within shield said steel ball is moved along a longitudinal portion of said groove while being held within said hole until said ball reaches a stopping point in said groove at the front end of said groove, whereby said drawer is held in a closed position with said spring forcing said drawer outward until an inward force is applied against said spring causing said ball to be moved from said stopping point and allowing said ball to move within said longitudinal portion of said groove so that said drawer is opened.

4,216,858

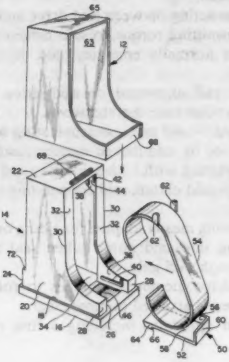
WRISTWATCH DISPLAY PACKAGE

Roger P. Beauchamp, Harrisville, R.I., assignor to International Packaging Corp., Pawtucket, R.I.

Filed Apr. 23, 1979, Ser. No. 32,949

Int. Cl.[3] **B65D** *5/50, 85/40*

U.S. Cl. 206—45.15 **21 Claims**



1. A package for alternatively displaying and enclosing an article such as a wrist watch comprising, a base, an article holder disposed in said base and a cover adapted for alternate disposition with respect to said base so as to accomplish the display and enclosure modes, said base of substantially box-like configuration having top, front and rear walls interconnected by a pair of opposed laterally spaced sidewalls, said sidewalls of a somewhat L-shaped configuration such that said top wall forms the top of said L-configuration, the front wall forms the lower forward extremity thereof, and the rear wall forms the stem thereof, said walls cooperating to form a combined article display area and a centrally disposed front access opening for said article at a front face thereof located on the same side of the base as said front wall, said access opening further defined by edge portions of said sidewalls which are laterally spaced from each other, said cover of essentially similar configuration as said base including a front access opening disposed at the front face thereof, said cover being of slightly larger dimensions such that said cover is adapted to fit over said base in said display position wherein the respective top, front, rear and sidewalls of both said base and said cover are disposed face to face with each other with the access openings in registration thereby allowing access to the article display area, said cover further adapted for 180° rotation for disposition over said base in said enclosure mode wherein said cover front and rear walls are respectively disposed face to face with said base rear and front walls and wherein said cover top, rear and sidewalls are disposed over the front face of said base so as to enclose the same thereby preventing access to the article display area.

17. A package for displaying an article such as a wristwatch comprising a base and an article holder disposed in said base, said base of substantially box-like configuration having a front wall and a top wall in turn connected by means of a pair of opposed laterally spaced sidewalls, said sidewalls of a somewhat L-shaped configuration such that said top wall forms the top of said L-configuration and said top wall is generally horizontally disposed and the front wall forms the lower forward extremity thereof, said walls cooperating to form a combined article display area and a centrally disposed front access opening for said article, said access opening further defined by pivot support means adjacent edge portions of said sidewalls and adjacent said top wall, said article holder including pivot means at the upper end thereof for engaging said pivot support means, the bottom of said holder being in engagement with and rearwardly slidably movable on a lower, upwardly facing

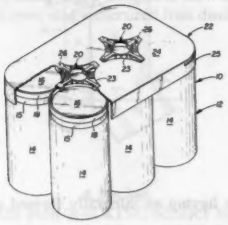
surface adjacent said front wall for movement into said access opening by pivoting of said pivot means.

4,216,859

CAN CLIP AND PACKAGE

James S. Bader, Lakewood, and James C. Sciacca, Westminster, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Jan. 22, 1979, Ser. No. 5,435
Int. Cl.[2] B65D *71/00*
U.S. Cl. 206—159 **15 Claims**



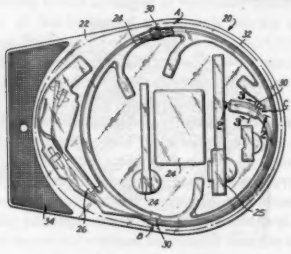
1. An improved clip of the kind for engaging a segment of the chime on a single end of a predetermined plurality of approximately axially parallel cans to form a multi-can package, the clip being of the type having a clip body with a plurality of discrete portions, each intended for association with at least one of said plurality of cans, and having a plurality of discrete means for engaging a segment of a can chime, said means being located at spaced positions about the perimeter of said body, at least one chime engaging means being associated with each of said discrete body portions, wherein the improvement comprises at least one line of weakness separating adjacent discrete body portions for relative bending between chime engaging means without substantial deformation of the chime engaging means during axial nonalignment, in use, of the cans engaged in the chime engaging means.

4,216,860

MEDICAL DEVICE CONTAINER AND METHOD OF MANUFACTURE

Lester Heimann, Somerset, N.J., assignor to Electro-Catheter Corporation, Rahway, N.J.

Filed Dec. 11, 1978, Ser. No. 968,342
Int. Cl.[2] B65D *85/20*; A61B *19/00*
U.S. Cl. 206—370 **9 Claims**



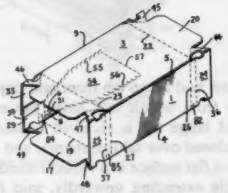
1. A container for elongated flexible sterile medical devices comprising a substantially rigid tray having at least one elongated depression sized and shaped for receiving said device without a pressure fit, a flexible backing sheet which is at least partially bonded to said tray to seal said device within said depression, at least two flexible inserts affixed to said backing sheet in spaced relation on the surface of said backing sheet facing said tray, said inserts being sized and shaped for insertion into said depression at separate spaced locations to urge said device into engagement with at least two discrete portions of said depression whereby said backing sheet may be manually peeled away from said tray with said inserts attached thereto such that at least two said inserts are pulled out of said depression sequentially and disengage said device sequentially and allow same to fall in a controlled manner without manual contact being necessary.

4,216,861

TUBULAR CARTON

James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 4, 1978, Ser. No. 965,928
Int. Cl.[3] B65D *65/12, 65/28*
U.S. Cl. 206—427 **4 Claims**



1. A tubular carton comprising a bottom wall **(1)**, a pair of side walls **(2,3)** foldably joined respectively to the side edges of said bottom wall, a top wall **(6,7)** foldably joined along the side edges thereof respectively to the upper edges of said side walls, said side walls being disposed perpendicular to said top and bottom walls to form a sleeve, an end flap **(16,17,20,21,24,25,28,29,32,33)** foldably joined to each end of said top, bottom, and side walls, at least a portion of each of said end flaps being disposed perpendicular to the major axis of said sleeve, a fold line **(26,27,30,31,34,35)** disposed between each end flap and the associated one of said walls, and wherein the improvement involves bend line **(36–41)** disposed in one of said end flaps and generally parallel to said fold line, a pair of web structures **(42–49)** joined respectively to the ends of said one end flap, a pair of said end flaps being joined respectively to said web structures remote from said one end flap and two of said walls being foldably joined respectively to said pair of end flaps, the corners of said two walls which are associated respectively with said pair of web structures being bevelled and severed from adjacent portions of the carton, and the portions of said one end flap which are disposed on opposite sides of said bend line being angularly related inwardly of the carton.

4,216,862

CHILDREN'S LUNCH BOX

Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 23, 1979, Ser. No. 32,062
Int. Cl.[3] A45C *11/20*; B65D *25/28*
U.S. Cl. 206—541 **7 Claims**

1. A children's lunch box comprising, in combination:

(a) a base container having an upper opening;

(b) an integrally formed handle extending forwardly from a side of said container below said opening;

(c) at least one integrally formed hinge tab extending from an opposite side of said container below said opening;

(d) a cover for closing said upper opening of said container;

(e) at least one hinge block integrally formed on a side of said cover and having a slot receiving said hinge tab, said hinge tab having a thin portion adjacent to its integral connection to said container so that it can flex;

(f) cooperating means integrally formed with said hinge tab

and block for retaining said tab in said slot under normal hinging movements occurring in the opening and closing of said lunch box, said cooperating means being manually yieldable to permit removal of said tab from said slot when it is desired to physically separate said cover and container; and

(g) an integrally formed flange extending outwardly at a

level below said hinge tab from said opposite side of said container from which said hinge tab extends such that when said hinge tab is received in said block and said cover is closed over said container, and said lunch box is placed on a flat surface in a vertical standing position with said handle extending upwardly, said flange and block simultaneously engage said flat surface to stabilize the box in said vertical standing position.

4,216,863

BAG PACK

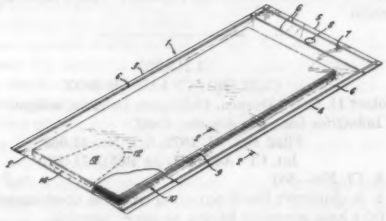
Donald Seymour-Smith, Bristol, England, assignor to A. J. Bingley Limited, Bristol, England

Filed Mar. 20, 1979, Ser. No. 22,362

Claims priority, application United Kingdom, Mar. 21, 1978, 11158/78

Int. Cl.² B65D *83/00, 85/62*

U.S. Cl. 206—554 **12 Claims**



1. A bag pack comprising:

a wallet of flexible sheet material enclosing and containing a stack of bags of plastics film material;

each said bag in said stack of bags being individually and separately folded in half so that said bags are not nested or interlocked together; and

said wallet being formed with means for gaining access to said bags from outside said wallet, whereby said bags can be removed singly from said wallet.

4,216,864

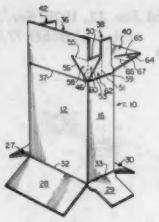
CONTAINER WITH AN INTEGRALLY FORMED SPOUT AND BLANK THEREFOR

John J. Austin, Jr., Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Feb. 26, 1979, Ser. No. 15,225

Int. Cl.² B65D *5/74, 17/24*

U.S. Cl. 206—622 **25 Claims**



1. A container having an integrally formed spout comprising:

a front panel, two side panels and a rear panel connected along generally parallel fold lines to provide a multi-sided body;

a glue flap interconnecting two of said panels;

a bottom closure for said body connected to at least one of said panels;

first and second top closure flaps hingedly extending respectively along fold lines from the tops of two adjacent panels and extending perpendicular to said two adjacent panels;

said top closure flaps being integrally formed and having a fold line therebetween; and

means, in said top closure flaps, defining three hingedly connected, superimposed triangular areas, said means including a first frangible perforated line in said first top closure flap and a second frangible perforated line in said second top closure flap,

said triangular areas forming the spout once said frangible perforated lines are severed and said triangular areas are pulled outwardly from said multisided body.

4,216,865

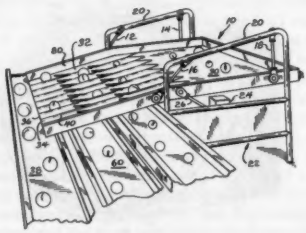
WHOLE FRUIT SIZE GRADER

Robert G. Dudley, c/o Dudley Machinery Company P.O. Box 3038, Montery, Calif. 93940

Filed Jun. 15, 1978, Ser. No. 915,757

Int. Cl.² B07C *5/12*

U.S. Cl. 209—539 **6 Claims**



1. In a whole fruit size grader, a generally horizontally oscillated sorting table having a generally horizontal flat loading area on which fruit to be size-graded is loaded and a downwardly sloped sorting area having an upper corrugated surface across its width defining a series of side-by-side close related troughs extending in the direction of said oscillation, each said troughs having inwardly-sloped spaced side walls which guide

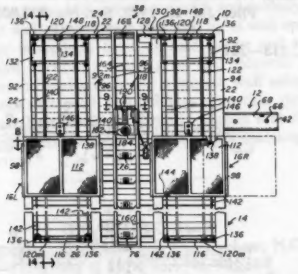
the fruit downwardly toward the lower discharge end of the troughs, the side walls and base of said troughs at their upper end merging into the generally horizontal flat surface of the loading area of the sorting table to receive said fruit therefrom as the table is oscillated, each said troughs having at least one discharge opening upstream of their lower end, said discharge opening having a generally tapered shape of a width through which full size fruit cannot pass, the narrow end of said tapered discharge opening being located upstream so as to engage and direct undersized fruit for discharge through the downstream wider end of said opening, and having means arranged over said discharge opening of the troughs to slow down the movement of the fruit over said undersized fruit discharge openings.

4,216,866

APPARATUS FOR RACKING SHEET MATERIALS

Thomas D. Fahey, Denver, and George P. McGannon, Westminster, both of Colo., assignors to McCallin Steel Storage Systems, Inc., Commerce City, Colo.

Filed Sep. 11, 1978, Ser. No. 941,200
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—1.5 **10 Claims**



1. The apparatus for racking sheet materials and the like which comprises: an open-sided generally box-like frame having front and rear end walls; rails carried by said end walls cooperating with one another to define a plurality of horizontal tray-receiving tracks arranged in vertically-spaced relation; a single tier of flat-bottomed trays each having side frame members supporting same on said tracks for horizontal movement between a retracted position essentially centered within said frame and either one of two extended positions overhanging a side of the latter; tray transfer means carried by each tray accessible at vertically-spaced positions on the same end wall of the frame for shifting said trays independently of one another between their retracted and either of their extended positions; first vertically-disposed rail means carried by the frame on the end wall thereof where the tray transfer means are accessible; carriage means mounted on said first vertically-disposed rail means for vertical movement thereon to positions where access can be had to each of the tray transfer means; horizontally-disposed rail means carried by said carriage means extending longitudinally of the frame; and reversible tray transfer drive means mounted on said horizontaly-disposed rail means for longitudinal movement thereon between a disengaged position and an engaged position operatively coupled to one of said tray transfer means when longitudinally-aligned therewith.

4,216,867

DISPLAY RACK HAVING STACKED DISPLAY TRAYS

Michael R. Sturm, Brookfield, Wis., assignor to Display Corporation International, Milwaukee, Wis.

Filed Aug. 7, 1978, Ser. No. 931,863
Int. Cl.[2] A47F 5/02
U.S. Cl. 211—77 **15 Claims**

1. A display rack including:
a vertical pole,
a plurality of separable display trays supported in vertically stacked relation on said vertical pole and for supporting a plurality of cylindrical containers, at least one of said display trays including, an upper tray member and a lower tray member fixedly secured together and defining a hollow cavity therebetween,
said upper tray member including means for supporting the cylindrical containers in upwardly inclined relationship, said upper tray portion including a first central aperture for housing said vertical pole and an upper surface including a plurality of upwardly sloping cylindrical container supporting surfaces, and
said lower tray member including means for supporting said upper tray portion in vertically spaced relation above an adjacent display tray.

4,216,868

OPTICAL DIGITAL SENSOR FOR CRANE OPERATING AID

Steven Geppert, Bloomfield Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 4, 1978, Ser. No. 931,221
Int. Cl.[3] B66C 13/48
U.S. Cl. 212—155 **24 Claims**

1. In a crane including a first portion and a second portion, said portions being operably moveable with respect to one another, an absolute encoding digital optical sensor comprising:
detector means associated with one of said portions and including an array of light emitting elements;
encoder means associated with the other of said portions and operative to optically impart digitally encoded informa-

tion to said detector means representative of the displacement between said portions;

means operative to energize a series connected plurality of said light emitting elements; and

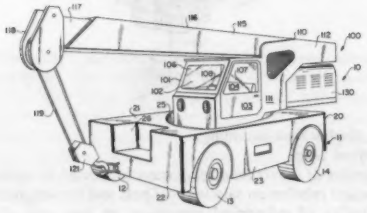
a fault detection circuit operative to maintain a constant current through said series connected plurality of light emitting elements and to generate a fault condition signal operative to deenergize all of the light emitting elements within said array upon detecting a failure of any one of said light emitting elements.

4,216,869

INDUSTRIAL CRANE

John L. Grove, Greencastle, Pa., assignor to JLG Industries, Inc., McConnellsburg, Pa.

Filed Sep. 21, 1977, Ser. No. 835,195
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—165 **23 Claims**



1. An industrial crane comprising:

(a) a chassis, wheels for supporting said chassis, bearing means on said chassis for rotatably supporting an upper works, and

(b) an upper works on said bearing means comprising: a cab located at the front of said upper works, said cab comprising control means, an operator's seat, and having front and side windows, boom support means behind said cab, a boom pivoted on said boom support means and extending forwardly over said cab, lift cylinder means behind said cab and below said boom for raising said boom, a source of energy behind said lift cylinder means, said cab, boom support means and boom being laterally centered on said upper works, crane upper works elements which extend above said windows other than said boom being rearwardly of said cab.

whereby to provide unobstructed vision for an operator in said seat in said cab forwardly, to both sides, and rearwardly over both shoulders.

4,216,870

CRANE MOUNTING

Garland W. Bonneson, Brookfield, and Kenneth V. Johnson, Oconomowoc, both of Wis., assignors to Bucyrus-Erie Company, South Milwaukee, Wis.

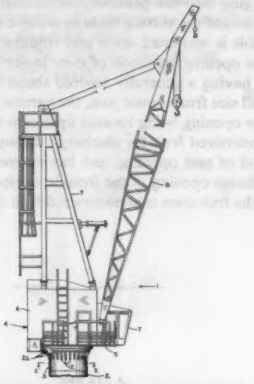
Filed May 24, 1978, Ser. No. 909,238
Int. Cl.[2] B66C *23/62, 23/84*
U.S. Cl. 212—223 **7 Claims**

1. In a mounting for a crane having a base and an upper works rotatably supported by the base, the combination of:

a circumferential member on said base that provides overhanging, downwardly facing surface areas that extend circularly about the base;

an arcuate member secured to said upper works positioned concentric with said circumferential member and having an inwardly projecting lip that underhangs said circumferential member at a spaced distance from said downwardly facing surface areas; and

a series of buttresses secured to and extending outwardly from said arcuate member, said buttresses including abutment ends facing and spaced from said upper works to



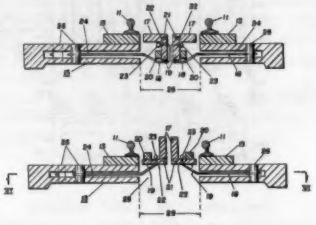
form a gap therebetween that prevents the abutment ends from normally engaging the upper works.

4,216,871

CAR UNCOUPLERS FOR MODEL TRAIN TRACKS

William J. Rocereta, 402 Butterfield Dr., North Hungtingdon Township, Westmoreland County, Pa. 15642

Filed Jul. 10, 1978, Ser. No. 922,832
Int. Cl.[2] B61G *7/04*
U.S. Cl. 213—211 **8 Claims**



1. A car uncoupling device for model train tracks assembled on conventional cork roadbeds comprised, in combination, of a track section and a car-coupler release component; said track section being mounted above said car-coupler release component in interlocking relation thereto and extending beyond opposite sides of said car-coupler release component for attachment in assembly to cork roadbed sections; said track section including ties between the track rails only on the extensions thereof for attachment to said cork roadbed sections; a base member of said car-coupler release component of substantially the same depth as the cork roadbed and adapted to abut against the ends of sections thereof to which said track section is attached in assembly; raised ledges on opposite sides of an opening through said base member between the rails of said track section, said ledges abutting against the adjacent ties of said track section to position and lock said car-coupler release component and said track section in assembly; a pair of wings between said raised ledges rotatably mounted on pivots parallel to and adjacent to the center line of said track section; means operable from outside said car-coupler release component for rotating said wings upwardly towards one another to deflect the uncoupling fingers of conventional car couplers indexed above said car-coupler release component, and flanges attached to said wings for rotating said wings by gravity to rest

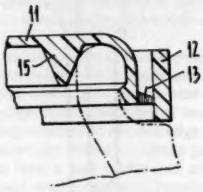
at a level below said rails, said flanges extending at right angles to said wings from the axes of said pivots.

4,216,872

TAMPER-PROOF CONTAINER

John R. H. Bean, Brighton, Australia, assignor to Brickwood Holdings Proprietary Limited, Cheltenham, Australia

Filed Jan. 11, 1979, Ser. No. 2,562
Claims priority, application Australia, Aug. 28, 1978, 5692/78
Int. Cl.[2] B65D *41/32*
U.S. Cl. 215—253 **3 Claims**



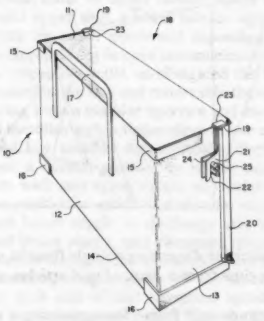
1. A tamper-proof container comprising a container body having a neck portion, said neck portion incorporating an opening, a peripheral lip about said opening, a recessed portion below said lip and a shoulder portion forming the base of said recess and extending beyond the extremity of said lip; and a closure for said container body comprising a top portion adapted to cover said opening, a first dependent side wall portion adapted to extend over said lip, a flange dependent from said top portion and concentric with and radially spaced from said first wall portion such that said lip of said opening of said container is wedged between said flange and said first dependent wall portion, a beading on said sidewall portions adapted to seat in said recess and a second wall substantially encircling said first wall and having a portion detachably secured to said first side wall, radially spaced therefrom and concentric therewith, said second wall portion seating on said shoulder portion.

4,216,873

CIGARETTE TRAY

Robert T. A. Pifer, 2218 Shoreham Dr., Durham, N.C. 27707

Filed May 1, 1978, Ser. No. 901,584
Int. Cl.[2] B65D *7/12, 19/02*
U.S. Cl. 220—4 R **2 Claims**



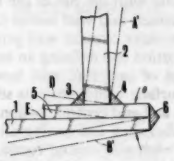
1. An improved device comprising: a cigarette tray having three abutting sides, a bottom, an open top and an open side; a pair of double, juxtaposed, headless, post like cleat means, each having a length equal to approximately twice its diameter secured one to each of the sides adjacent said open side in the area of said open top, each of said double cleat means being outwardly disposed generally vertically from its respective side means; a lid like closure for said open side including a tray engaging, flange like bracket with a generally vertical slot having a depth of greater extent than the combined diameters of said double posts in one edge thereof and being secured to said lid and disposed generally perpendicular thereto so as to lie generally juxtaposed to the exterior of the side walls adjacent said double cleat means whereby said slots will engage said cleats to releasably attach said lid to said tray; and an inwardly extending hook like flange means secured to said lid adjacent each of said slotted brackets for hookingly gripping the upper edge of said side adjacent said cleats when the same are in retaining engagement with said slots whereby said lid will remain connected to said tray even during extremely abusive handling.

4,216,874

WELD ASSEMBLED TANK

Kiwa Torisu, No. 35-1, 3-chome, Maebara-higashi, Hunabashi-shi, Chiba-ken, Japan

Continuation of Ser. No. 810,182, Jun. 27, 1977, abandoned.
This application Nov. 29, 1978, Ser. No. 964,602
Int. Cl.[2] B65D *7/02, 7/42*
U.S. Cl. 220—5 A **10 Claims**



1. A generally cylindrical, upright weld-assembled tank, particularly suited for storing liquids comprising, in combination: a bottom formed to include a substantially planar base plate having a generally disc-shaped configuration; an annular supporting member having a radially inner circumferential edge and a radially outer circumferential edge superposed over said base plate; and an upstanding generally cylindrical side wall formed from a cylindrical shell plate having an inner side and an outer side and a bottom edge superposed directly upon said annular supporting member and rigidly joined thereto, said shell plate being joined to said annular supporting member along said bottom edge thereof with said annular supporting member having said radially outer circumferential edge integrally joined to said base plate with said radially inner circumferential edge being disconnected from said base plate and free to move relative thereto, with said radially inner circumferential edge of said annular supporting member being thereby free to separate from said base plate in response to internal stresses developed on the interior of said tank from liquid contained therein, with said bottom edge of said shell plate being rigidly joined to said annular supporting member along a portion of said supporting member intermediate said radially inner and outer circumferential edges thereof and spaced therefrom, and with said integral joinder of said outer circumferential edge of said annular supporting member to said base plate and said rigid joinder of said bottom edge of said shell plate to said annular supporting member being spaced apart a minimum distance sufficient to cause internal pressure within said tank applied against said upstanding shell plate due to liquids contained within said tank to cause said radially inner circumferential edge of said annular supporting member to separate from said base plate and to be lifted therefrom.

4,216,875

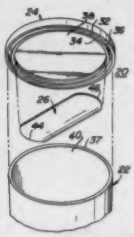
COMBINATION UTENSIL AND LID FOR PACKAGED COMESTIBLES

Walter F. Stanish, 118 Rochelle Ave., Philadelphia, Pa. 19128

Filed Mar. 12, 1979, Ser. No. 19,384

Int. Cl.[2] B65D *51/24*

U.S. Cl. 220—212 **4 Claims**



1. In combination, a utensil and a lid for sealing a container, said container being arranged for holding a product therein and having a circular mouth for access to the contents of said container, said mouth including a circular rim disposed thereabout, said lid comprising a central portion and annular wall means projecting at an angle to the central portion, said wall means encircling the periphery of the central portion and being arranged to cooperate with the rim of the container to secure said lid to said container, said wall means comprising an inner circular wall and an outer circular wall projecting downward from said central portion and defining an annular recess therebetween for receipt of said rim, said inner wall having an annular free edge surface which projects slightly inward radially, said inner wall and said central portion defining a circular central recess therebetween and having an entrance which is smaller in diameter than said central recess, said utensil being formed of a thin, strong, yet relatively flexible plastic and comprising an elongated linear body slightly bowed in cross section along its length to provide longitudinal rigidity and to enable at least two similarly constructed utensils to nest together within said central recess at any diametric angular orientation therein, said utensil body having a pair of opposed arcuate ends, each having a radius of curvature approximately equal to the radius of curvature of said central recess with the maximum length of said utensil body measured between said arcuate ends being approximately the same size as the diameter of the central recess, whereby said utensil is frictionally held within said recess between opposed portions of said inner wall yet can be readily removed therefrom for use on the contents of said container without affecting the ability of the lid to seal said container.

4,216,876

PRESSURE OPERATED COUPLER

Hans Warnke, Herne, Fed. Rep. of Germany, assignor to Klockner-Werke AG, Duisburg, Fed. Rep. of Germany

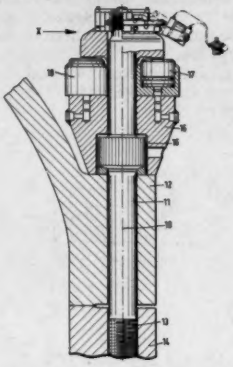
Filed Jul. 3, 1979, Ser. No. 54,445

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1978, 2836127

Int. Cl.[2] B65D *45/32*

U.S. Cl. 220—319 **6 Claims**

1. In a pressure vessel having a cover and at least one elongated bolt for securing said cover on to said vessel, said bolt having annular grooves at an outer end thereof, a clamping ring disposed on said bolt, and a coupler asssembly for clamping said ring on to said bolt, the improvement wherein said coupler assembly comprises an opposing pair of clamping jaws having grooved inner walls engageable with said annular grooves in a clamping position and being disengageable from said grooves in an unclamping position, said jaws being movable in a common plane toward and away from one another between said positions, a pressure-operated piston and cylinder unit, support means extending outwardly of one of said jaws, the cylinder of said unit being pivotally mounted on said support means, linkages pivotally connected at one end to the other of said jaws, the piston of said unit being pivotally connected to the opposite ends of said linkages, and said unit being disposed at an angle to said common plane, whereby said jaws are capable of being moved toward and away from one another between said positions upon actuation of said unit causing said piston and cylinder to move opposite one another.



4,216,877

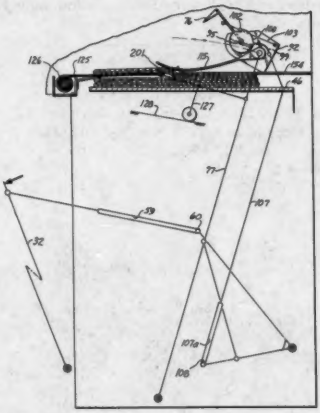
VENDOR FOR FLAT ARTICLES AND METHOD OF VENDING SAID ARTICLES

Lyle V. Dutro, 1908 Meadowbrook, Altadena, Calif. 91001

Filed Dec. 27, 1977, Ser. No. 864,773

Int. Cl.[2] B65H *5/16*

U.S. Cl. 221—213 **27 Claims**



1. A vendor for dispensing a single flexible, substantially flat article at a time from a stack of said articles, comprising:

a frame;

a platform on said frame for supporting a stack of articles from which an end article is to be dispensed;

separator means comprising an article engaging member movable to a first position in engagement with said end article, and to a second position not in engagement therewith;

release means comprising latch means for holding said arti-

cle engaging member in said second position, and means for releasing said article engaging member to move to said first position;

support means mounted to said frame supporting said article engaging means for traverse movement relative to said end article and for rotation relative thereto for lifting an edge of said end article in a peeling type movement from said edge while said article engaging member is in said first position;

conveyor means mounted to said frame and insertable beneath the lifted edge of said end article while part of said article rests on the article next beneath it in the stack, thereafter to convey said end article away from the stack after the article is released by the article-engaging means; and

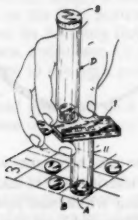
actuator means mounted to said frame which, when permitted to function, releases said latch means to enable the article engaging member to engage said end article adjacent to said edge, move the support means to cause the article engaging member to lift said edge in a peeling-type movement, move the conveyor means past said edge and underneath at least a part of the end article, release the article from said article engaging member, and move the conveyor means with the end article away from the stack.

4,216,878

BINGO CHIP DISPENSER

Gaetan Naud, 330 St. Joseph, Donnacona Cté Portneuf, Quebec, Canada (G0A 1T0)

Filed Jul. 20, 1978, Ser. No. 926,945
Int. Cl.[2] B65D *83/04*; G07D *1/00*
U.S. Cl. 221—264 **3 Claims**



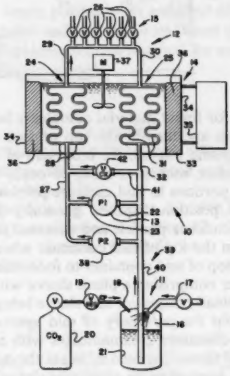
1. A chip dispenser comprising an elongated table having upper and lower walls having inside surfaces spaced from each other and defining a horizontal slot in the table intermediate the upper and lower walls, an upper tubular nipple extending upwardly from said upper wall, a lower tubular nipple spaced longitudinally from the upper nipple and depending from the lower wall, both nipples being in open communication with the slot through the respective walls, an elongated flat key member slidably mounted in the slot and removable therefrom, the key member having both a circular aperture and an elongated aperture formed therethrough, a finger piece at one end of said key member, said key member longitudinally displacable in said slot between a normal position in which said circular aperture registers with said upper nipple to receive one chip and an operative position in which said circular aperture is in register with said lower nipple to discharge said last named chip through said lower nipple, said elongated aperture being located on one side of said circular aperture relative to said key member and extending longitudinally of the latter, a finger protruding from each end of said elongated aperture in the plane of said flat key member and spaced from the longitudinal edges of said elongated aperture, the two fingers extending towards but spaced from each other, a compression coil spring disposed within said elongated aperture and receiving said fingers at both ends whereby said spring is retained within said elongated aperture by said fingers, said lower wall having an elongated opening made therethrough in register and coextensive with said elongated aperture in the normal position of said key member for insertion and retrieval of said spring therethrough by compressing the coil spring to clear at least one finger, said upper wall having a groove at its inside surface registering and coextensive with said elongated opening and accomodating the top portion of said coil spring, said elongated opening accomodating the lower portion of said coil spring, the ends of said groove and of said elongated opening forming abutment surfaces between which said spring is confined whereby said spring is compressed by movement of said key member in either one of two opposite directions with respect to its normal position, said spring member consequently not only returning said key member from its operative to its normal position upon release of said finger piece, but also preventing removal of said key member from within said slot.

4,216,879

METHOD OF AND APPARATUS FOR DISPENSING A HIGH VOLUMETRIC FLOW RATE OF CARBONATED BEVERAGE, HAVING PARTIAL REVERSAL OF A CIRCULATING FLOW

John R. McMillin, Maplewood, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Aug. 16, 1978, Ser. No. 934,158
Int. Cl.[3] B65D *83/14*
U.S. Cl. 222—1 **56 Claims**



1. A method of dispensing a carbonated beverage comprising the steps of:

(a) carbonating a previously uncarbonated beverage to a predetermined degree of saturation;

(b) storing a supply of the carbonated beverage under a predetermined propellant gas pressure;

(c) conducting the carbonated beverage from the supply and into a circulation loop;

(d) circulating the conducted carbonated beverage in a predetermined direction of flow around the loop and past a dispensing outlet;

(e) selectively dispensing carbonated beverage from the loop via the outlet; and concurrently with said step of dispensing,

(f) reversing the direction of flow of carbonated beverage in part of the loop; and

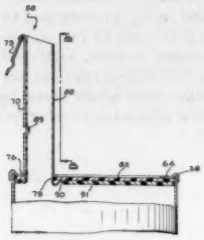
(g) propelling carbonated beverage from the supply into the loop and through the said part of the loop in a direction of flow toward the dispensing outlet and in said reversed direction.

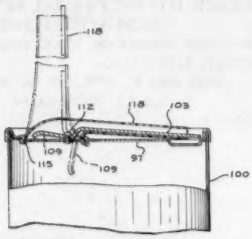
4,216,880

COLLAPSIBLE SPOUT FOR DISPENSING FLUENT MATERIALS

Marek K. Drelichowski, 105 White St., Westfield, Mass. 01085

Filed Jun. 28, 1978, Ser. No. 919,971
Int. Cl.[2] B65D *47/08, 47/10*
U.S. Cl. 222—83 **2 Claims**





1. Dispenser for fluent material containers having a portion for providing an aperture in the top of said container, said dispenser comprising a lever, the inner end of which being in the form of a cutter, said lever being pivotally mounted intermediate its end portions to said aperture portion and pivotable between a first position disposed generally parallel to and spanning said container portion and a second position extending upright from the top of said container wherein said cutter end pierces the top of said container to form said aperture, said dispenser further comprising a pliant sleeve within which said lever is longitudinally disposed, said sleeve being affixed at one end thereof about the periphery of said aperture so that the interior of said container communicates with said sleeve, the outer end of said sleeve disposed adjacent the outer end of said lever and being adapted to be open, said sleeve being collapsible to substantially flat condition in said first position for closing said aperture, wherein a portion of said sleeve is disposed between the top of said container and the undersurface of said lever, pivotable movement of said lever to its second position causing the opening of said sleeve into an upstanding tubular pour spout for said container.

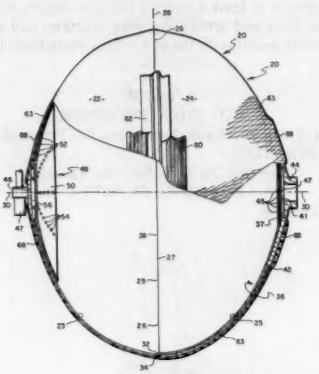
2. Dispenser for fluent material containers having a portion for providing an aperture in the top of said container comprising a lever in the form of a generally flat strip including a pull tab at the outer end thereof, said lever being pivotably disposed adjacent an edge portion of the aperture, said lever being pivotable between a first position disposed generally parallel to and spanning said container portion and a second position extending upright from the top of said container, said dispenser further including a pliant sleeve affixed along one longitudinal portion thereof to the underside of said lever and affixed at one end thereof about the periphery of said aperture so that the interior of said container communicates with the interior of said sleeve, the outer end of said sleeve disposed adjacent the outer end of said lever and being adapted to be open, said dispenser further including a recess provided in the top of said container, said recess being adapted to receive said strip and to accommodate said sleeve in flat, collapsed condition, beneath said strip for closing said aperture, said dispenser further including means for releasably retaining said lever in an upright position relative to the top of said container, pivotable movement of said lever to its upright position causing the opening of said sleeve into an upstanding tubular pour spout for said container.

4,216,881

PROPELLANT STORAGE EXPULSION SYSTEM

Irwin E. Rosman, Woodland Hills, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 10, 1978, Ser. No. 904,691
Int. Cl.[2] B65D *35/22*
U.S. Cl. 222—94 **28 Claims**



1. In a fluid expulsion tank apparatus wherein fluid pressure is exerted between the interior wall of said tank and an exterior wall of a collapsible liner within said tank to expel fluid from said tank contained within said liner, the improvement which comprises:

a tank formed in an oblate spheroid shape, said tank having a polar axis defining first and second poles, and an equator perpendicular to said polar axis located midway between said first and second poles wherein the radius of said equator is greater than the distance between the equatorial planeand one pole, said tank having a decreasing radius of curvature from said pole to said equator,

a collapsible liner conforming substantially to the shape of said tank,

an inlet orifice formed by said tank located near said first pole of sand tank,

an exit orifice formed by said tank located near said second pole of said tank,

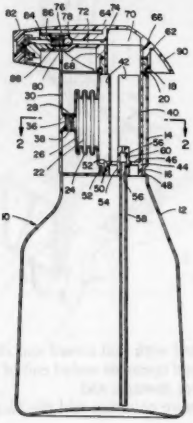
fluid contained within said liner, the fluid being expelled from said liner when the liner is subjected to said fluid pressure exerted between the interior wall of the tank and the exterior wall of said liner, the predetermined curvature of the liner controls the collapse of said liner from said first pole of the tank along the polar axis towards the opposite second pole in ever-widening concentric circles substantially parallel to the plane of the equator, said liner collapses in a rolling collapse mode such that random buckling is precluded, initial collapse of the liner commences in the area of said first pole, the liner substantially reverses upon itself as the fluid is expelled through said exit orifice.

4,216,882

BELLOWS NECK SQUEEZE FLUID DISPENSER

Peter A. Basile, Hudson; Carl E. Bochmann, Brecksville, and Jack Halbeisen, Hudson, all of Ohio, assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 8, 1978, Ser. No. 940,397
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—207 17 Claims



12. In a manually operable fluid dispenser having a bottle portion adapted to contain liquid, a neck portion, a dispenser body being mounted on the neck portion in fluid communication therewith, means for isolating fluid in the neck portion from the bottle portion, and means for allowing fluid to flow from the bottle portion to the neck portion, an improvement comprising:

a pair of flats formed upon said neck portion;

a flexible wall formed on a side of said neck portion between said flats; and,

pump means for pumping fluid from said neck portion to said dispenser body by collapsing of said flexible wall, said pump means including a curved trigger mounted on said bottle neck and slidable on said flats inwardly toward said flexible wall to partially collapse said flexible wall and spring coupling means for coupling said trigger with said flexible wall and for permitting continued collapsing of said flexible wall.

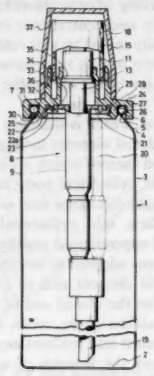
4,216,883

CONSTRUCTION FOR SUPPORTING ATOMIZING MEANS OF MANUALLY OPERABLE ATOMIZER

Takaharu Tasaki; Shigeo Iizuka, and Tadao Saito, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1978, Ser. No. 924,231
Claims priority, application Japan, Aug. 20, 1977, 52-111639[U]; Mar. 20, 1978, 53-35921[U]
Int. Cl.[2] B05B *9/043*
U.S. Cl. 222—321 7 Claims

1. In a manually operable atomizer having an atomizing means supported by the neck opening portion of a liquid container and adapted to perform an atomizing action, a pressurizing chamber constituted by a cylinder and a piston included by said atomizing means and adapted to perform a pumping action, an atomizing head by means of which said piston is depressed to perform said pumping action and a nozzle through which the pressurized liquid in said pressurizing chamber is atomized; a construction for supporting said atomizing means comprising: a flange extending outwardly from an upper portion of said cylinder; a supporting member adapted to support said atomizing means through the medium of said flange, said supporting member having retaining means for engaging the edge of said neck opening portion of said container; a first annular wall projected from said supporting member; an annular recess formed in said flange adapted to fittingly receive said first annular wall; and a second annular wall projected from said supporting member surrounding said first annular wall, said second annular wall being provided in its lower outer peripheral surface with a first retaining section as said retaining means, the portion of said flange around said annular recess being turned to form a circumferential upright protrusion provided in its lower portion with a second retaining section, said second annular wall having in its lower inner peripheral surface a third retaining section adapted for engagement with said second retaining section.

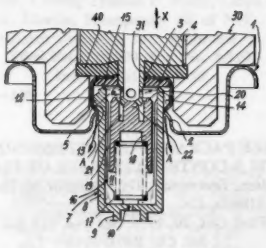


4,216,884

AEROSOL DISPENSING VALVES

Giancarlo Giuffredi, Milan, Italy, assignor to Coster Tecnologie Speciali S.p.A., Milan, Italy

Filed Sep. 28, 1978, Ser. No. 946,806
Claims priority, application Italy, Sep. 17, 1977, 29763 A/77
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.16 1 Claim



1. An improved aerosol dispensing valve, comprising: a tubular body of resilient plastic material with a closed end and having a crown gear formed externally at the open end of the body, said body including a sealed surface at the rim of the open end, said body having a cylindrical tubular extension from the outside of the closed end and a hole on the closed end between the inner portion of the cup and the bore of said tubular extension, the inner cylindrical surface of said body having longitudinal ribs;

a rigid metal cup for connection to an aerosol container, said cup having a central hole in the closed end and having

flanges extending from the open end of the metal cup to provide for said connection;

a resilient annular gasket located in said cup surrounding said central hole and completely filling the closed end of said cup, said metal cup being crimped about said crown gear on said body so as to provide mechanical pressure between said sealing rim on said body and said resilient sealing gasket;

a discharge tube having an outer diameter such that said tube fits closely within said central hole in said metal cup and is circumferentially sealed by said resilient annular gasket, said discharge tube having transverse holes near one end thereof, said holes being of smaller diameter than the thickness of said annular gasket;

a cylindrical element which is slidingly installed inside said body, said cylindrical element having an annular sealing surface on the end thereof which is closer to the open end of said body, said cylindrical body being adapted to receive an end of said discharge tube within the annulus of said sealing surface, said cylindrical element having a recess at the end opposite said sealing surface; and

resilient biasing means adapted to be retained by said recess in said cylindrical element and to bias said cylindrical element away from the closed end of said body, wherein in the closed condition of the valve, said cylindrical element is biased against said resilient annular gasket to provide a seal around the annulus of said gasket and the transverse holes in said discharge tube are located so as to be occluded by the thickness of said resilient annular gasket, the valve being opened by forcing said discharge tube against the action of said cylindrical element permitting the inner portion to communicate with said tube through said transverse holes, and providing additional flowing passages by forcing said discharge tube and cylindrical element against the closed end of said cup with sufficient force to provide elastic deflection of said crimp about said crown gear so that said seal between the rim of said body and said resilient gasket is interrupted, permitting flow around the rim of said body and between the teeth of said crown gear.

4,216,885

DISPOSABLE PACKAGE FOR DISPENSING LIQUIDS WITH A CONTROLLED RATE OF FLOW

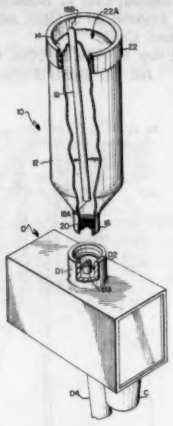
Jason K. Sedam, Dunwoody, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Oct. 20, 1978, Ser. No. 953,105
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—481 **12 Claims**

1. A disposable package for dispensing liquids with a controlled rate of flow comprising:

a container having a closed end and a discharge end defining a discharge opening through which liquids may be dispensed;

a flow rate control tube having an openable sealed end and an open end, the tube extending substantially longitudinally of said container with the sealed end of said tube extending through said closed end of said container and said open end being disposed within said container at a predetermined distance from said discharge opening to control the flow rate of liquid through said discharge opening;



means associated with said closed end of said container for protecting said openable sealed end of said flow rate control tube from damage; and

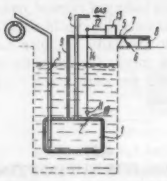
a frangible closure covering said discharge opening.

4,216,886

IMMERSIBLE PNEUMATIC WEIGHING DOSER FOR MOLTEN METALS

Anton D. Puschalovsky, Brest-Litovsky prospekt, 180a, kv. 7; Leonid I. Prokopenko, ulitsa Deputatskaya, 21, kv. 13, and Dmitry L. Strizhevsky, Bolshaya Zhitomirskaya ulitsa, 17, kv. 6, all of Kiev, U.S.S.R.

Filed Mar. 30, 1979, Ser. No. 25,604
Int. Cl.[2] B67D *1/04*
U.S. Cl. 222—595 **9 Claims**



1. An immersible pneumatic weighing doser for molten metals comprising:

a measuring vessel having a filling opening;

a pipe for supplying a compressed gas into the interior of said measuring vessel;

a discharge pipe for discharging molten metal from said measuring vessel, said pipe being disposed within the interior of said measuring vessel with one end thereof close to the bottom of said measuring vessel;

a weighing controller including:

a support;

a lever pivotly mounted on the support, said measuring vessel being secured to one end of said lever;

a stress pick-up for receiving the stress of said lever;

a closing device for said filling opening including;

a saddle comprising a part of said measuring vessel and defining said filling opening;

a locking element interacting with the saddle;

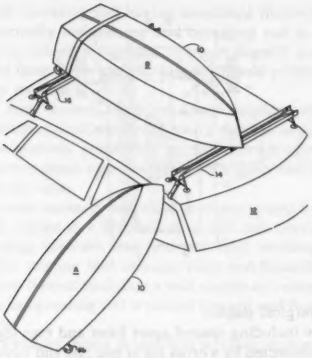
a locking element drive mounted on the lever of said weighing controller.

4,216,887

APPARATUS USEFUL FOR LOADING AND SECURING A BOAT ONTO A VEHICLE

Don L. Kieffer, RFD 5, County Rd., Bedford, N.H. 03102

Filed Jan. 12, 1979, Ser. No. 3,017
Int. Cl.[2] B60R 9/00
U.S. Cl. 224—310 10 Claims



1. Apparatus useful for loading and securing a boat onto a vehicle, comprising:

a single mounting means mounted at a first end of said boat, said single mounting means including a shaft portion extending outwardly from said boat and a head portion attached to an outer end of said shaft portion, the diameter of said head portion being greater than the diameter of said shaft portion; and

a single elongated tubular bracket horizontally mounted on an upper surface of said vehicle and extending perpendicularly to a longitudinal axis of said vehicle, said bracket having

an opening extending therethrough from a first end to a second end of said single bracket, for receiving and passing said head portion therethrough, and

a longitudinal slot in an upper wall of said single bracket, said slot extending from said first bracket end to at least a midpoint of said single bracket and having a width greater than said diameter of said shaft portion and less than said diameter of said head portion, for receiving and passing said shaft portion therethrough, and said bracket including

catch means located at a midportion of said single bracket, for selectively (1) retaining said single mounting means within said midportion of said single bracket, and (2) allowing said single mounting means to pass longitudinally along said single bracket between said midportion and at least said first bracket end,

said single mounting means engaging said single bracket with said head portion within said opening and said shaft portion extending through said slot so that said single mounting means and said single bracket support said first end of said boat and restrain said first end of said boat to allow movement of said first end of said boat only along said single bracket while loading and unloading said boat while allowing said boat to pivot around said single mounting means, and

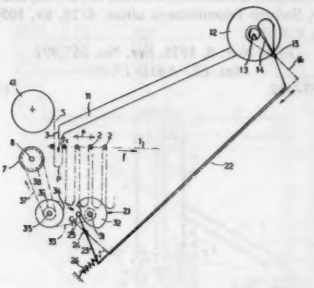
said catch means capturing said single mounting means within said midportion of said single bracket to secure said boat to said vehicle.

4,216,888

INSTALLATION FOR THE FORMATION OF SUSPENDED FOLDS IN TEXTILE STRIP MATERIAL

André Lotte, Amiens, and Raymond Gross, Mulhouse, both of France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse, France

Filed Jan. 31, 1979, Ser. No. 7,934
Claims priority, application France, Feb. 8, 1978, 78 03472
Int. Cl.[2] B65H 17/42
U.S. Cl. 226—104 9 Claims



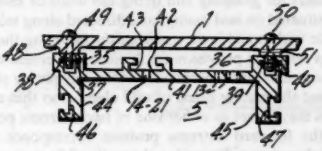
1. An installation for the formation of suspended folds of textile material in strip form comprising, a chain of rods, means for moving said chain of rods horizontally at a low speed, means for continuously depositing at the upstream end of said chain of rods a strip of textile material at a much higher rate than the rate of travel of said chain of rods so as to form suspended folds of material between said rods, a stationary blowing nozzle for directing a jet of steam or hot air onto said upstream end of said chain of rods in order to initiate the formation of each fold between two successive rods of the chain, and a device for cyclic regulation of the discharge of hot air or steam from the nozzle from a predetermined maximum value during commencement of formation of a fold to a zero value after only a fraction of the time required for the formation of a complete fold has elapsed.

4,216,889

VACUUM TANK FOR MAGNETIC TAPE HANDLERS

Roger Mosciatti, Coram; Thomas P. Foley, Lloyd Harbor, and Frederick G. Moritz, Hauppauge, all of N.Y., assignors to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Feb. 2, 1979, Ser. No. 8,553
Int. Cl.[2] G11B 15/58
U.S. Cl. 226—118 1 Claim



1. In a magnetic tape handler, a vacuum tank including;

a metal extrusion comprising a rectangular flat body several times longer that it is wide with rectangular projecting sides along the edges of said body and forming a rectangular channel therewith;

undercut longitudinal channels along both edges of said body opposite said projecting sides for receiving mounting bolts for securing said body to a main frame;

undercut longitudinal channels along the outer sides of said

projecting sides for receiving mounting bolts for mounting cover hinges or the like;

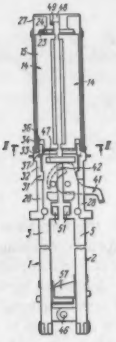
and a raised undercut channel along said body on the side of said body opposite to the side carrying said projecting sides for receiving vacuum sensing hose terminals.

4,216,890

SURGICAL APPARATUS FOR SUTURING ORGANS WITH METAL STAPLES

Ernest M. Akopov, Dubninskaya ulitsa, 61, kv. 88, and Petr M. Postolov, Sadovo-Triumfalnaya ulitsa, 4/10, kv. 105, both of Moscow, U.S.S.R.

Filed Nov. 6, 1978, Ser. No. 957,991
Int. Cl.[2] A61B *17/00*
U.S. Cl. 227—22 **17 Claims**



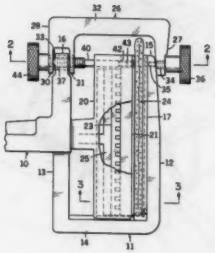
1. A surgical apparatus for suturing organs, such as intestines, stomach, vessels and the like, with metal staples in the end-to-end, end-to-side and side-to-side methods, with the working part of the apparatus disposed outside of the organs being sutured, comprising: two clamps; two jaws of each of said clamps for fixing one of the organs being sutured therebetween, said clamps being detachably joined together so that when joined the mating plane of said jaws of each of said clamps is perpendicular to the mating plane of said clamps; two magazines with slots for staples, each of said magazines being mounted on one of said jaws of each of said clamps; pushers for pushing out said staples from said magazine slots; two dies with grooves for clinching said staples, each of said dies disposed on one of said clamp jaws so that said magazines and dies interacting with each other during suturing are situated on the jaws of different clamps; means for grasping and fixing the walls of the organs being sutured; four casings of said means, fastened on said jaws, one of said casings being fastened to each of said jaws; members for grasping and fixing the walls of said organ or organs, situated on said casings and directed along said jaws; guides made within said jaws, ensuring the fastening therein of said casings with the provision for limited movement of each of said casings in a plane, perpendicular to the mating plane of said jaws and the mating plane of said clamps, so that each of said casings may be set to either one of two extreme positions of which the forward extreme position corresponds to the moment of clamping and grasping the walls of the organs being sutured, whereby said fixing members lie between the mating surfaces of said jaws of said clamps and at some distance in front of the mating surfaces of said clamps in their separate state, and in the backward extreme position in which said fixing members lie at some distance from the mating surfaces of said clamp jaws and approximately within the mating surfaces of said clamps; locks locking said casings in said forward position, mounted on said jaws; and locks locking said casings in said backward position, mounted on said jaws and retaining said jaws regardless of the reciprocal position of said jaws and the suturing clearance width between said magazines and said dies.

4,216,891

SURGICAL STAPLER

Harold O. Behlke, 4060 Toenges, St. Louis, Mo. 63116

Filed Feb. 12, 1979, Ser. No. 11,304
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—30 **12 Claims**



1. In a surgical stapler:

(a) a jaw including spaced apart front and rear legs rigidly interconnected by a cross leg at one end and having opposite free ends,

(b) an anvil on the front leg,

(c) a movable frame located between the front and rear legs,

(d) a staple cartridge assembly, including staples, carried by the movable frame, the movable frame determining a gap between the staple cartridge assembly and anvil for receiving tissue,

(e) a pusher member for ejecting staples from the staple cartridge assembly to staple tissue located in the gap between the staple cartridge assembly and anvil, and

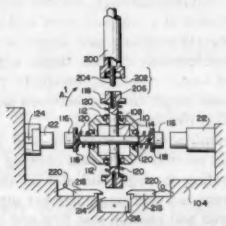
(f) a C-clamp detachably connected to the free ends of the front and rear legs of the jaw for maintaining alignment of the front and rear legs during stapling operation.

4,216,892

DEVICE FOR MANUFACTURING STATOR CORES

Koichi Asai; Tohsuke Kawada, both of Aichi; Yoshiyuki Iwaki, and Ryozo Kuroda, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,399
Int. Cl.[2] H02K *15/02*
U.S. Cl. 228—44.1 R **8 Claims**



1. A device for manufacturing a stator core, said device comprising:

a rotary member mounted to be successively intermittently rotated about a rotational axis, said rotary member having at least four peripheral portions spaced about said rotational axis, said peripheral portions being arranged in pairs

of peripheral portions spaced diametrically opposite each other with respect to said rotational axis;

at least two operating rods extending orthogonally of each other through said rotary member, each said operating rod being mounted for reciprocal sliding movement, radially of said rotational axis, through a respective said pair of peripheral portions of said rotary member;

at least four carriers, one each of said carriers being mounted on a respective end of a respective said operating rod at a position exterior of the respective said peripheral portion of said rotary member;

each said operating rod having associated therewith means for normally maintaining said operating rod in a neutral position whereat the said carriers thereof are equally spaced from the respective said peripheral portions of said rotary member;

at least first, second, third and fourth working stations sequentially spaced about said rotary member at positions to be successively confronted by said carriers upon successive intermittent rotation of said rotary member about said rotational axis;

first cylinder means at said third working station for pushing a said carrier at a first end of one of said operating rods extending between said first and third working stations and for moving said one operating rod from the neutral position thereof such that a said carrier at a second end of said one operating rod is moved toward said first working station;

second cylinder means at said first working station for pushing a wound core onto said carrier at said second end of said one operating rod;

third cylinder means at said second working station for pushing a said carrier at a first end of another of said operating rods extending between said second and fourth working stations and for moving said another operating rod from the neutral position thereof such that a said carrier at a second end of said another operating rod is moved toward said fourth working station;

threaded pulling means at said second working station for meshing engagement with said carrier at said first end of said another operating rod and for pulling said operating rod toward said second working station until a wound core positioned on said carrier at said first end of said another operating rod is compressed between said carrier and said third cylinder means;

welding means at said second working station for welding the thus compressed wound core to thereby form a completed stator core;

a completed stator core removal channel located at said fourth working station;

pawl means associated with said removal channel for removing a completed stator core from said carrier at said second end of said another operating rod when said threaded pulling means is operated to pull said another operating rod toward said second working station and for retaining the thus removed completed stator core in said removal channel; and

discharge means for discharging said thus removed completed stator core from said removal channel.

4,216,893

APPARATUS FOR REMOTELY REPAIRING TUBES IN A STEAM GENERATOR

Raymond H. Glatthorn, St. Petersburg, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 775,676, Mar. 8, 1977, abandoned. This application May 22, 1978, Ser. No. 908,046

Int. Cl.[2] B23K *37/02*

U.S. Cl. 228—45 **9 Claims**

1. Apparatus for remotely repairing tubes disposed in a tube sheet in a channel head of a steam generator having a manway disposed in said head, said apparatus comprising:

a column rotatably disposed in said head generally perpendicular to said tube sheet;

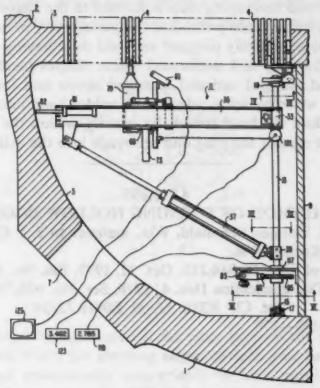
a boom pivotally mounted on said column;

means for rotating said column and said boom therewith;

means for pivoting said boom from a position generally parallel to said tube sheet to a position generally aligned with said manway;

a carriage disposed to ride lengthwise along said boom;

means for moving said carriage lengthwise along said boom and for affixing the position of said carriage on said boom;



a tool operative on a tube;

a tool holder pivotally disposed on said carriage so as to axially align said tool with the axis of a tube and to allow rotation of the tool and tool holder so that they fit through the manway;

means for moving the tool rectilinearly, said means being disposed on said tool holder whereby said apparatus will perform repair operation on said tubes; and

an extension for said boom whereby, when connected thereto, said carriage can be driven through said manway.

4,216,894

PORTABLE SOLDERING APPARATUS

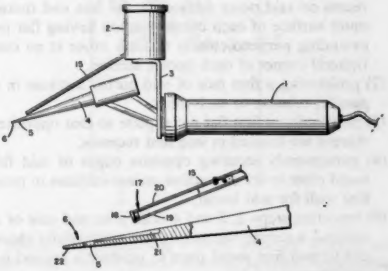
Raymond M. X. Gleizes, 10, rue Pasteur, 77300 Fontainebleau, France

Filed Jul. 18, 1978, Ser. No. 925,760

Claims priority, application France, Jul. 9, 1977, 77 22049

Int. Cl.[2] B23K *3/02, 3/06*

U.S. Cl. 228—52 **8 Claims**



1. An improved soldering device of the type for soldering by means of preformed solder shapes such as beads, the improvement comprising; a solder bit: an elongated dispenser including a magazine for said preformed solder shapes, an extractor for

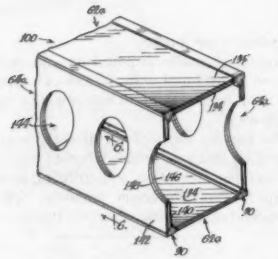
said preformed solder shapes arranged at the bottom of said magazine, means for actuating the extractor, and a conveying duct which opens at one end beneath said extractor and at the other end proximate the free end of said solder bit, wherein said solder bit is formed with a passageway extending entirely through said solder bit and extending transverse to the longitudinal axis of the solder bit and located proximate said free end and dimensioned to permit through passage of the preformed solder shapes and having formed therein a longitudinal groove which opens into said passageway and being of a width equal to the greatest dimension of said preformed solder shapes, wherein said conveying duct is formed in the shape of a tube with the end located proximate the passageway in said soldering bit being entirely plugged and said duct having an orifice for discharging said preformed solder shapes located proximate said plugged end and arranged above said longitudinal channel whereby upon release of a solder bead into the conveying duct the bead travels by gravity within the duct and impinges against the plug and rebounds into the orifice.

4,216,895

METHOD OF FORMING HOLLOW BOOM

Terry M. Holmes, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Division of Ser. No. 844,213, Oct. 21, 1977, Pat. No. 4,171,598.
This application Dec. 4, 1978, Ser. No. 965,799
Int. Cl.³ B23K *31/00*; E04H *12/34*
U.S. Cl. 228—178 **7 Claims**



1. A method of producing a hollow, rectangular boom comprising the steps of:

(1) forming four metal corner sections, each of said corner section being generally L-shaped in cross-section with first and second legs extending substantially perpendicular to each other and having inner and outer surfaces, one of said legs having a first recess on said inner surface on the free end thereof and the other of said legs having a second recess on said outer surface on the free end thereof, the outer surface of each corner section having flat portions extending perpendicularly to each other at an outer peripheral corner of each corner section,

(2) positioning a first pair of said corner sections in spaced parallel relation to each other,

(3) positioning a first flat metal plate so that opposite edges thereof are located in said first recesses,

(4) permanently securing opposite edges of said first flat metal plate to the respective corner sections to produce a first wall for said boom,

(5) repeating steps **2**, **3** and **4** with a second pair of corner sections, a second flat metal plate substantially identical in size to said first metal plate to produce a second wall for said boom,

(6) positioning said first and second walls in spaced parallel relation to each other,

(7) positioning a third flat metal plate so that opposite edges are located in said second recesses of an adjacent pair of corner sections,

(8) permanently securing opposite edges of said third plate to said adjacent pair of corner sections,

(9) positioning a fourth flat metal plate so that opposite edges are located in the second recesses of the remaining pair of corner sections, and,

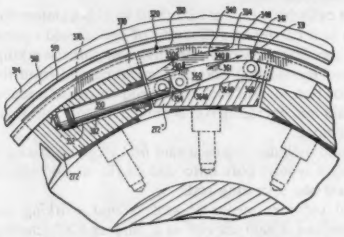
(10) permanently securing the opposite edges of said fourth plate to said remaining pair of corner sections to produce a rigid hollow rectangular boom.

4,216,896

AUTOMATIC PIPE WELDING APPARATUS AND METHOD

Nuke M. Chang, Santa Ana, Calif., and Robin Renshaw, St. Charles, Ill., assignors to Santa Fe International Corporation, Orange, Calif.

Division of Ser. No. 767,769, Feb. 11, 1977, Pat. No. 4,144,439.
This application Mar. 17, 1978, Ser. No. 887,826
Int. Cl.² B23K *37/04*
U.S. Cl. 228—212 **7 Claims**



1. A method of preparing pipe sections for use with an automatic pipe welding system, in which the ends of the pipe sections are machined to provide at least one reference surface thereon, said method comprising:

positioning first clamping means inside one pipe section and extending clamp members therefrom to bear equally on the interior surface of said one pipe section to therey align said first clamping means relative to the central longitudinal axis of said one pipe section;

positioning a second clamping means which is coupled to and axially movable relative to said first clamping means inside a second pipe section and extending clamp members therefrom to bear equally on the interior surface of said second pipe section to thereby align said second clamping means relative to the central longitudinal axis of said second pipe section and to align the central longitudinal axes of said first and second pipe sections;

positioning a third clamping means so that the clamp members thereof are intersected by a radial plane containing the prepared end of said one pipe section;

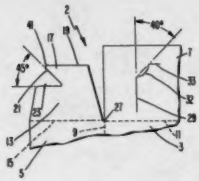
moving said second clamping means and its engaged pipe section axially toward said first clamping means and its engaged pipe section to bring the prepared end of said second pipe section into abutment with the prepared end of said first pipe section;

extending a plurality of clamp members of said third clamping means radially outwardly to engage the inner surfaces of said first and second pipe sections substantially equally to apply substantially equal radial forces circumferentially around said first and second prepared pipe ends to thereby concentrically align said pipe ends with said aligned central longitudinal axes and extending a back-up band from said third clamping means to bring said back-up band into engagement with said abutting pipe ends and straddling same to create an interior weld mold around the inside of the pipe line between the portions of the first and second pipe sections engaged by respective members of said third clamping means.

4,216,897
LOCK FOR A CORNER LOCK CARTON

Peter C. Collura, Los Altos, and Richard L. Humphries, Sunnyvale, both of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Apr. 9, 1979, Ser. No. 28,177
Int. Cl.² B65D 5/26
U.S. Cl. 229—35 **8 Claims**



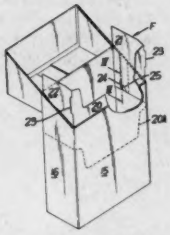
1. An improved corner lock carton formed from a paperboard blank or the like, comprising:
(a) a base panel;
(b) first and second wall panels formed adjacent to said base panel and separated therefrom respectively by first and second fold lines;
(c) a locking flap panel formed adjacent to said first wall panel and separated therefrom by a fold line, said flap panel fold line being substantially perpendicular to said first fold line;
(d) slit means formed on said second wall panel and spaced inwardly thereon, said slit means cooperating with said locking flap panel to form an interlocking corner for said carton, said slit means comprising:
(i) a first segment substantially perpendicular to said second fold line;
(ii) a second segment adjoining said first segment, at least the ends of which being disposed at a first acute angle with respect to said first slit segment; and
(iii) a third segment adjoining said second segment, said third segment being substantially parallel to said second fold line;
(e) said locking flap panel including a lock member, said member having a first edge portion substantially parallel to said flap panel fold line and a second edge portion disposed at a second acute angle with respect to said flap panel fold line, said second acute angle being greater than said first acute angle, said first and second edge portions defining said lock member; whereby when said wall panels are erected, a portion of said flap panel which includes said lock member is disposed through said slit means with said second edge portion of said lock member engaging said second segment of said slit means at a point substantially adjacent the juncture of said second slit segment with said first slit segment, and defining an acute included angle therebetween with an upper portion of said lock member overlapping said third slit segment, to securely interlock and retain said lock member and said second wall panel together.

4,216,898
CIGARETTE PACKETS

Robert W. Davies, London, England, assignor to Molins Limited, London, England

Continuation of Ser. No. 712,299, Aug. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 584,072, Jun. 5, 1975, abandoned. This application Jan. 17, 1978, Ser. No. 870,170
Int. Cl.² B65D 5/34
U.S. Cl. 229—44 CB **17 Claims**

1. A hinged lid packet comprising a body having a back wall, a front wall, a pair of side walls and a base; a lid having front and side portions, and a rear portion hinged to said back wall; and an inner frame having a pair of side walls and a front wall which are mounted respectively against the inside of said side and front walls of said body, providing pairs of adjacent front and side walls, and which project upwardly beyond the upper level of said back wall so as to bear frictionally against the inside of said side and front portions of the lid when closed and extend downwardly interiorally of said body to a position intermediate said base and said upper level of said back wall, the wall of said body of at least one of said pairs of adjacent walls comprising inner and outer layers of material; at least one pair of abutting edges located at said at least one of said pairs of adjacent walls, one of said abutting edges of each pair being located at the wall of said inner frame and the other of said

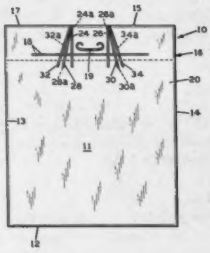


abutting edges being located at the inner layer of the adjacent wall of said body, the abutting edges of each pair facing upwardly and downwardly respectively to limit movement of said inner frame towards said base, one of said abutting edges being formed by a projection which protrudes from the plane of the wall of said inner frame into the plane of the inner layer of the adjacent wall of said body and faces downwardly and the other of said abutting edges being formed by a cut-out in said inner layer of said adjacent wall of said body and facing upwardly, said outer layer of said adjacent wall of said body being imperforate and being disposed in a plane contiguous to said inner layer.

4,216,899
PLASTIC BAG HANDLE CONSTRUCTION

Ewald A. Kamp, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

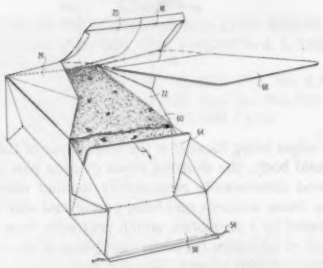
Filed Dec. 22, 1978, Ser. No. 972,427
Int. Cl.² B65D 33/02, 33/08
U.S. Cl. 229—54 R **9 Claims**



1. A plastic bag comprising a front wall and a back wall fabricated from a thermoplastic material, said bag being closed at one end and along its sides and being opened at its other end, said open end being characterized in that a portion of said front wall is folded upon itself at said open end transversely along a fold line defining the upper edge of said open end of said bag and being adhered to the unfolded portion of said front wall to form a first reinforcing flap, and a portion of said back wall is

folded upon itself at said open end transversely along a fold line defining the upper edge of said open end of said bag and being adhered to the unfolded portion of said back wall to form a second reinforcing flap, a cut out portion disposed in each of said reinforcing flaps and said front and back walls defining a carrying handle for said bag and a plurality of weld lines on each side of said cut out handle extending over at least a portion of the width of each of said reinforcing flaps, said weld lines nearest the carrying handle extending generally perpendicular to the top and bottom of said bag and said weld lines more remote from said carrying handle being directed obliquely toward the lower corners of said bag.

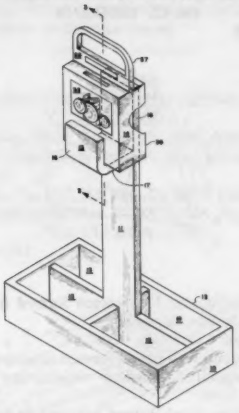
4,216,900
COLLAPSIBLE BAG WITH ENLARGABLE OPENING
Robert J. Dederick, 290 River Rd., Port Ewen, N.Y. 12466
Filed Jan. 11, 1979, Ser. No. 2,639
Int. Cl.[2] B65D *33/02*
U.S. Cl. 229—55 **3 Claims**



1. A bag comprising a sheet of flexible material folded upon itself with opposed edges thereof connected together to define a hollow substantially rectilinear tube having front, rear and a pair of side walls, bottom flap means integral with said walls secured together in overlapping relation to define a bottom wall, top flap means integral with said walls being foldable to define top closure means which may be opened and closed, fastening means for securing said top closure means in closed condition and gusset means disposed between said side walls and at least one of said front and rear walls to provide an enlarged opening in conjunction with the opening formed by said top flap means, stiffening means inserted into said bag for partially surrounding the contents, said stiffening means being comprised of a side panel and two end panels integral therewith, said side panel having transverse weakened lines formed therein along which said stiffening means may be reduced in size as the contents of the bag are removed so the bag may be readily folded to a smaller size without interference from said stiffening means.

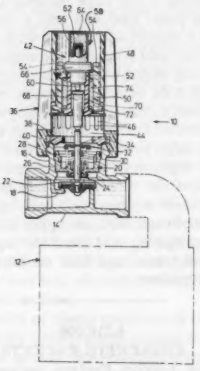
4,216,901
APPARATUS FOR SAFEGUARDING MONEY
Oise R. Allen, 9400 Telstar Dr., Richmond, Va. 23234
Filed May 7, 1979, Ser. No. 36,621
Int. Cl.[2] E05G *1/04*
U.S. Cl. 232—1 D **2 Claims**

1. A device for safeguarding money comprising a base having a flat underside adapted for durable attachment to the upper surface of a table and an upper side provided with positioning means to accommodate standard items customarily found on a restaurant table, an elongated member extending upwardly from said base, harness means associated with the upper extremity of said elongated member, a container having a narrow elongated aperture located in an upper portion thereof, said container being engaged by said harness means and having a hinged access door adapted to swing outwardly away from the interior of said container and further adapted to fit in abutment with said harness means, a detaining chamber disposed within said container beneath said aperture and behind a transparent window positioned within the periphery of said container, said detaining chamber being provided with bottom closure means capable of movement to cause downward discharge of the contents of said chamber, said move-



ment being controlled by means outside said container, and key operated locking means causing said container to be retained by said harness, whereby with a single unlocking manipulation said container can be removed from said harness means and the hinged access door can be opened to permit removal of the contents of said container.

4,216,902
THERMOSTATIC CONTROL VALVE
Heinz W. Braukmann, Willowdale, Canada, assignor to Braukmann Armaturen AG, Rothrist, Switzerland
Filed Mar. 23, 1978, Ser. No. 889,246
Int. Cl.[2] F24F *11/08*
U.S. Cl. 236—42 **4 Claims**



1. A thermostatically controlled valve for heated fluid flowing through a conduit has a valve seat and cooperating valve mechanism to permit the flow of fluid through said seat in said conduit, a housing open at one end, and adapted for securement to said conduit at the other end over said valve mechanism, a sensor secured in said open end of said housing and responsive to change in ambient temperature of the air above said housing, movable means in said housing responsive to the action of said sensor and operable on said valve mechanism to

regulate said flow through said seat, thermal shielding means in said housing below said sensor to prevent heat from the said valve mechanism effecting said sensor and air vents in said housing below said thermal shielding means to allow air heated by said valve mechanism to escape to atmosphere.

4,216,903

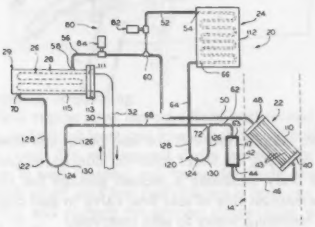
HEAT EXCHANGE SYSTEM FOR RECYCLING STACK HEAT

Anthony A. Giuffre, 4344 N. 70th St., Milwaukee, Wis. 53216

Continuation of Ser. No. 774,582, Mar. 7, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,814

Int. Cl.³ F24D *3/08*

U.S. Cl. 237—8 R **4 Claims**



1. In a building having a food cooking facility including a discharge flue communicating between the facility and the exterior of the building, blower means for drawing air bearing waste heat from the facility and impelling same through said flue and exteriorly of the building, with the building further including an air intake duct and blower means for drawing fresh air from exteriorly of the building and impelling it through said duct and into the building, said building also including a water storage tank containing water to be tempered, a heat recovery arrangement for alternately supplying heat from said flue to the fresh air passing through said duct or to said tank, said arrangement comprising:

a closed circuit heat generated refrigerant flow type refrigeration system mounted in the building and comprising:

a heat recovery coil mounted in said flue for providing a source of heat charged refrigerant,

a first heat transfer coil mounted in said duct,

a refrigerant receiver having upper and lower ends,

conduiting connecting said coils and said receiver in a first series connected refrigerant flow circuit,

a second heat transfer coil mounted remote from said tank in heat transfer relation to the water,

means for exposing said second heat transfer coil to the heat charged refrigerant of said heat recovery coil including conduit means connecting said heat recovery coil and said receiver in a second series connected refrigerant flow circuit,

said refrigerant conduiting and conduit means adjacent the respective heat transfer coils and said receiver being shaped to define a vertically disposed bight portion of upright U-configuration that is free of refrigerant flow obstructions for forming liquid refrigerant traps adjacent said heat discharge coils,

and a refrigerant filling said coils, said conduiting, said conduit means, and said receiver,

said receiver and said traps being horizontally aligned with the horizontal level of said recovery coil,

said refrigerant conduiting and conduit means including thermostatically controlled valve means for alternately disconnecting said heat transfer coils from said heat recovery coil in accordance with a predetermined ambient air temperature exteriorly of said building.

4,216,904

DEVICE FOR FASTENING A RAILWAY TRACK ON SLEEPERS DISPOSED END TO END

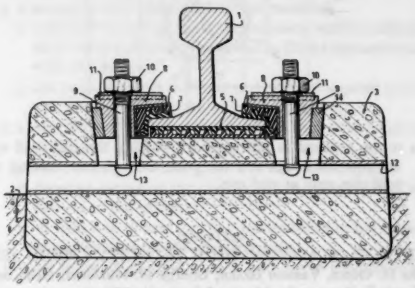
Robert Vivion, 38 rue George V, Eaubonne, France (95600)

Filed Jul. 20, 1977, Ser. No. 817,484

Claims priority, application France, Jul. 23, 1976, 76 22586

Int. Cl.² E01B *3/38*

U.S. Cl. 238—25 **12 Claims**



1. A railway track support and fastening arrangement comprising, for each rail, a substantially continuous rail bed for supporting a rail of the track, said rail having a bottom face; said bed having a longitudinal groove presenting an upwardly facing support surface and sides presenting lateral shoulders outwardly sloping facing each other and on opposite sides of and spaced from a rail; a substantially continuous pad of elastic material within said groove and between said support surface and the bottom face of the rail; substantially continuous clamp means on each side of the rail for securing the rail vertically and transversely, each clamp means being within said groove and comprising a plurality of clamp elements in adjacent end to end relation along the length of the rail, a substantially continuous lining pad between each clamp means and the rail; said pads and said lining pads comprising means for isolating the rail from the rail bed and from the clamp means, fastener means within said grooves at each side of the track for fastening said clamp means to secure the rail vertically and transversely, said fastener means comprising a plurality of spaced apart hold down elements extending downwardly between said clamp means and a lateral sloping shoulder of the groove, said hold down elements being supported laterally by said sloping shoulder to retain the rail laterally, and means securing said hold down elements to the rail bed.

4,216,905

CLIP-TYPE RAIL FASTENER

Karl-Heinz Muhr, Attendorn, and Horst Willwacher, Dnaden, both of Fed. Rep. of Germany, assignors to Muhr und Bender, Attendorn, Fed. Rep. of Germany

Filed Jul. 14, 1978, Ser. No. 924,714

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732250

Int. Cl.² E01B *9/30*

U.S. Cl. 238—349 **10 Claims**

1. An assembly for fastening a rail to a support, said assembly comprising:

a clip unitarily formed with

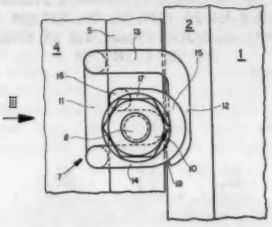
a single support leg having a pair of ends and resting on said support

a single bearing leg having a pair of ends and resting on the flange of said rail, said legs being generally parallel,

a bight extending between one end of said support leg and the corresponding one end of said bearing leg, and

an eye at the other end of said support leg, between said

legs and the ends thereof, and overlying said bearing leg; and



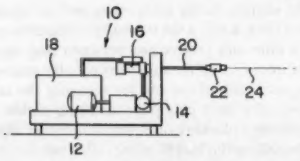
a screw secured in said support, passing through said eye between said legs and the ends thereof, and bearing on said clip only at said eye.

4,216,906

METHOD OF MAKING HIGH VELOCITY LIQUID JET

John H. Olsen, Vashon Island; George H. Hurlburt, Kent, and Louis E. Kapcsandy, Mercer Island, all of Wash., assignors to Flow Research, Inc., Kent, Wash.

Filed Jun. 21, 1976, Ser. No. 697,949
Int. Cl.[2] B05B *1/10*
U.S. Cl. 239—11 **25 Claims**



1. A method of providing a high velocity liquid jet, such as a water jet, said method comprising:

(a) removing from the liquid dissolved material which tends to precipitate as a solid at a temperature at least as high as 140° F.,

(b) pressurizing said liquid to at least fifteen thousand pounds per square inch, and

(c) directing said pressurized liquid through an orifice of a nozzle to form a high velocity coherent liquid jet, with said liquid passing through the orifice of the nozzle, without causing appreciable material deposits on the nozzle at the location of the orifice.

4,216,907

HYDRAULIC GUN

Robert J. Fuller, 520 N.E. 104th Ave., Vancouver, Wash. 98664

Filed Feb. 9, 1978, Ser. No. 876,470
Int. Cl.[2] B05B *9/00*
U.S. Cl. 239—127 **8 Claims**

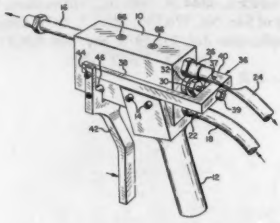
1. A hydraulic gun for directing a stream of water at high pressure, said gun comprising:

a gun body provided with a first valve having an upstream side including a seat and a downstream side including a valve head adapted to close against said seat to close said first valve, said first valve having a valve stem extending rearwardly through an end of said gun body, and a second valve having an upstream side including a seat and a downstream side including a valve head adapted to close against the last mentioned seat to close the second valve,

trigger means for closing said valve head of said first valve towards the corresponding seat, said trigger means comprising a forked lever pivotally supported at sides of said gun body with the forked end of said lever being disposed on either side of said gun body, and a U-shaped yoke attached at its closed end to said valve stem and having arms extending along said gun body and pivotally engaging the forked end of said lever,

spring biasing means urging the valve head of said second valve toward the corresponding seat,

said gun body having a first inlet passage for receiving water under pressure from a pump, said inlet passage being coupled to the upstream side of both said first and second valves,



a water supply reservoir for said pump and conduit means for coupling the water reservoir inlet to the gun body, said gun body including a second passage for coupling the downstream side of said first valve to said conduit means for returning water to said reservoir,

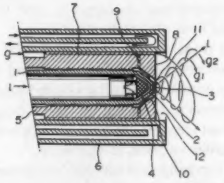
and a third passage in said gun body for coupling the downstream side of said second valve to a nozzle having a restricted orifice.

4,216,908

BURNER FOR LIQUID FUEL

Sumio Sakurai, Yokohama, and Takashi Hirano, Tokyo, both of Japan, assignors to Nippon Sanso K. K., Minato, Japan

Filed Jun. 26, 1978, Ser. No. 919,287
Claims priority, application Japan, Jun. 30, 1977, 52-78225
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—132.3 **14 Claims**



1. A burner for liquid fuel comprising a liquid fuel supply conduit having a tip portion provided with a fuel spraying nozzle at the front end portion thereof, an assembly for forming auxiliary combustion gas supplying passages, said assembly being disposed on the outer periphery of said liquid fuel supply conduit, a cooling jacket provided on the outer periphery of said assembly, and a combustion chamber formed by the inner peripheral surface at the front end portion of said jacket and the end surface of said assembly, said burner characterized in that one part of said auxiliary combustion gas passing through the auxiliary combustion gas flowing passage is ramified, and this branched-off flow of the auxiliary combustion gas is adapted to run along the outer periphery of the tip portion of the liquid fuel supply conduit to be belched out into the combustion chamber from parts which are formed on the end surface of said assembly and also on the outer periphery of the fuel spraying nozzle of the liquid fuel supply conduit.

4,216,909

BRAKE MECHANISM FOR ROTARY PARTS

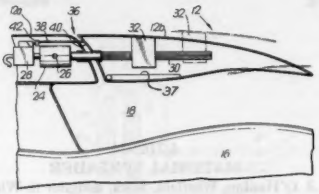
Robert N. Carlin, Nutthall, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 26, 1978, Ser. No. 946,075

Claims priority, application United Kingdom, Oct. 4, 1977, 41138/77

Int. Cl.² B64C *15/04*

U.S. Cl. 239—265.31 **4 Claims**



1. An assembly comprising:

a gas turbine engine cowl having a fixed portion and a translatable portion, at least one housing mounted within said engine cowl, first and second shafts mounted for coaxial rotation in said housing and being drivingly engageable with each other, said first shaft having at least one radially extending end portion for driving cooperation with said second shaft, said second shaft having at least one radially extending portion with a pair of angularly spaced faces between which said at least one radially extending end portion of said first shaft lies, the angular spacing of said faces being such as to permit limited relative rotation between said first and second shafts before driving engagement occurs in either direction, abutment means between said second shaft and said housing and including an annular ratchet supported within said housing for rotation relative thereto, wedging means for wedging said annular ratchet to said housing to prevent the relative rotation, said wedging means being movable to avoid said wedging, abutting means pivotally mounted on said second shaft for engagement with said abutment means to prevent rotation of said second shaft and engageable with said first shaft so as to be urged out of the abutting engagement when said first shaft drives said second shaft in one direction, said abutting means including a pawl pivotally positioned on said second shaft and having one end engageable by said first shaft, and resilient means urging said abutting means into abutting engagement with said abutment means as the roles of said first and second shafts are reversed, said resilient means being overridden when said pawl is pivoted out of engagement with said ratchet durng driving of said second shaft by said first shaft.

4,216,910

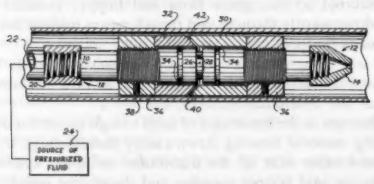
360 DEGREE INTERNAL SPRAY CLEANING

Wade L. Kimbrough, P.O. Box 1467, Hobbs, N. Mex. 88240

Filed Dec. 7, 1978, Ser. No. 967,471

Int. Cl.² B05B *1/14, 1/32*

U.S. Cl. 239—456 **2 Claims**



1. An internal spray nozzle comprising:

a. a mandrel having

b. a threaded supply end to connect the mandrel to a source of pressurized fluid,

c. an axial bore therethrough,

d. an elongated external circumferential groove on the mandrel,

e. a plurality of openings from the bore to the groove,

f. a first sleeve and

g. a second sleeve telescoped on the mandrel,

h. said sleeves having a correlative conic surface adjacent each other and located over and in fluid communication with the groove,

j. said conic surfaces over one end of the elongated groove and the openings at the other end thereof,

k. a circumferential O-ring seal between each sleeve and said mandrel,

m. said O-ring in a seal groove in the mandrel, and

n. locating means on the mandrel for locating both of said sleeves to the mandrel,

o. at least one of said locating means being in the form of a nutthreaded to said mandrel with

p. a set screw in said nut to lock said nut to the mandrel.

4,216,911

HIGH-PRESSURE LIQUID-JET GUN

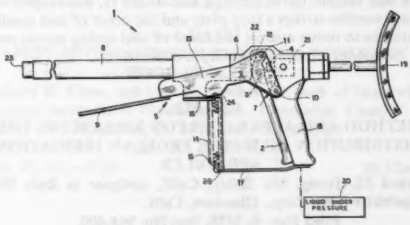
Adalbert Huperz, Hockenheim, and Wolfgang Maasberg, Hilnxe-Krudenburg, both of Fed. Rep. of Germany, assignors to Woma Apparatebau Wolfgang Maasberg & Co. GmbH, Duisburg, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,763

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804844

Int. Cl.² B05B *11/00, 7/02*

U.S. Cl. 239—526 **10 Claims**



2. A high-pressure liquid-jet gun comprising:

a housing;

means including an actuation member on said housing displaceable between a closed position and an open position for releasing a liquid from an end of said housing on displacement of said actuation member into said open position;

a safety lever on said housing displaceable between a safety position spaced from said housing and a use position relatively close to said housing;

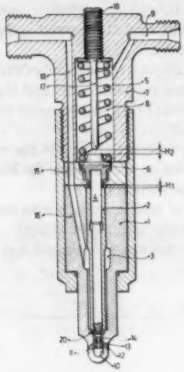
a trigger pivoted on said safety lever and engageable in said use position thereof with said actuation member, said trigger being displaceable in said use position of said safety lever between an advanced position with said actuation member in said closed position and a drawn-back position with said actuation member in said open position; and

biasing means urging said safety lever into said safety position.

4,216,912
FUEL INJECTION NOZZLE

Odon Kopse, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 906,290
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726296
Int. Cl.[2] F02M 61/04
U.S. Cl. 239—533.4 6 Claims

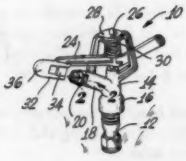


1. A fuel injection nozzle for internal combustion engines including a first pressure chamber in the nozzle, a valve needle which can be moved against a spring force by the fuel supplied into said first pressure chamber for controlling the flow of fuel from said nozzle, a hollow needle containing said valve needle for controlling the flow of fuel into said first pressure chamber, both of said needles movable through a stroke H_1 and one of said needles movable through a stroke H_2, further wherein a spring supporting plate is interposed between a spring means and said valve and hollow needles and said spring means urges both needles into a closing direction and subsequent thereto both said needles move through said stroke H_1 whereupon one of said needles strikes a stop plate and the other of said needles continues to move against the force of said spring means until the remainder of said stroke H_2 is effected.

4,216,913
METHOD AND APPARATUS FOR ENHANCING THE DISTRIBUTION OF WATER FROM AN IRRIGATION SPRINKLER

Edward M. Troup, Mt. Baldy, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.

Filed Dec. 4, 1978, Ser. No. 966,400
Int. Cl.[2] B05B 1/04
U.S. Cl. 239—594 17 Claims



1. A nozzle for generating a substantial secondary flow in a stream of water being ejected from an irrigation sprinkler of the impact or reaction drive type, said nozzle comprising:

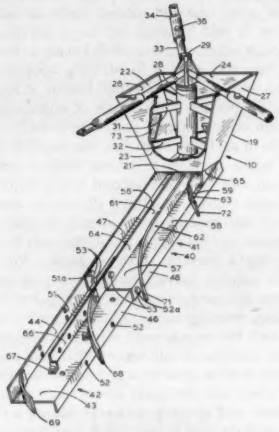
a generally tubular body having an aperture therethrough for receiving a stream of water supplied to said sprinkler; said aperture including a plurality of interior walls defining a frusto-pyramidal passage, said passage being of sufficient axial length to generate said substantial secondary flow in said stream of water; and

said frusto-pyramidal passage terminating in a polygonal outlet from said nozzle, thereby enhancing the distribution of water ejected from said sprinkler.

4,216,914
MATERIAL SPREADER

Dudley J. O'Hanlon, Winfield, Iowa, assignor to Winfield Agri-Builders Company, Winfield, Iowa

Filed May 23, 1979, Ser. No. 41,776
Int. Cl.[2] B65G 65/32
U.S. Cl. 239—666 5 Claims



1. In a spreader assembly:

(a) an upright hopper member of a square shape in transverse cross section,

(b) bearing means within said hopper member for rotation of the hopper member about an upright axis,

(c) an elongated inclined material distributor member,

(d) a plurality of side by side longitudinally extended trough means on the top surface of said distributor member,

(e) means securing the upper end portion of the distributor member to the lower end portion of the hopper member so that the top surface of the distributor member is inclined downwardly relative to a plane extended transversely of the hopper member and normal to the longitudinal axis thereof so that grain from said hopper member flows downwardly through said trough means toward the lower ends thereof,

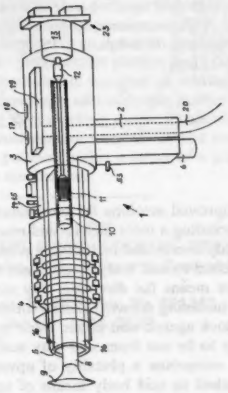
(f) said trough means being of progressively shorter length and decreased width from one side toward the other side of said distributor member, and

(g) means at the lower end of each trough means for deflecting material flowing downwardly therethrough towards said other side of the distributor member, whereby to rotate said hopper member and distributor member as a unit with said other side of the distributor member in a trailing relation.

4,216,915
ELECTROSTATIC POWDER SPRAY GUN

Alex Hengartner, Friedtalweg 13, Wil; Peter Wachter, Segantinistrasse 42, St. Gallen, and Kurt Baumann, Junkerstrasse 24, Wil, all of Switzerland

Filed Apr. 17, 1978, Ser. No. 897,110
Claims priority, application Switzerland, May 12, 1977, 5953/77
Int. Cl.[2] B05B 5/02
U.S. Cl. 239—698 8 Claims



1. A powder spray gun for electrostatic powder coating of a surface, said gun being of the type comprising:

a gun housing (1), including a muzzle (5);

a deflecting plate rod (8) coaxially disposed in said muzzle and extending out of the opening of said muzzle to form with said muzzle an annular powder channel, said rod being guided in said muzzle so that it is axially movable and having a threaded inner end portion;

a deflecting plate (9) fixed to the outer end of said rod;

electrodes (16) extending into said powder channel and electrically connected to a high voltage source,

a servo-motor (13) positioned in said gun housing drive means (11) positioned coaxially with said muzzle coupling the servo-motor (13) to the threaded inner end portion of said deflecting plate rod (8) to change its axial position with respect to the muzzle;

said powder channel having a laterally offset inlet end remote from said deflector plate (9) and positioned between the powder channel and said servo-motor;

a powder supply line (6) connecting a powder supply reservoir (7) with said powder channel inlet end;

motor control circuit means (23) connected to said motor, and electrical circuits disposed inside said housing including a first manually operable electrical pressure switch located on the gun housing, and (25, 26, 27), connected to and controlling, said motor control circuit means and hence said motor to control, by operation of the switch on the gun, the position of the deflecting plate (9) in front of the muzzle;

at least one further switch located on the gun housing, connected to and controlling at least one of:

the voltage level of said high voltage source; the amount of powder entering said powder channel; and

display means (15, 17, 18) located on said housing and displaying at least two of:

the position of the deflecting plate (9) with respect to the muzzle;

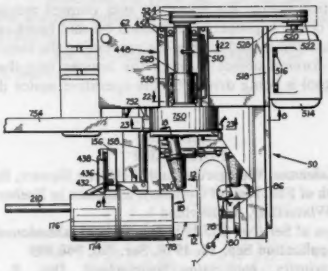
the level of high voltage connected to the electrodes (16);

the amount of powder supplied by the gun.

4,216,916
APPARATUS FOR SHREDDING TIRE CASINGS

Myron D. Tupper, Rte. 3, Box 37900, Sandy Heights, Oreg. 97055

Filed Feb. 14, 1979, Ser. No. 12,010
Int. Cl.[3] B02C 18/16, 25/00
U.S. Cl. 241—36 16 Claims



1. Apparatus for shredding tire casings, comprising:

(a) rotary tire support means for holding and rotating a tire about its axis, and

(b) a cutter assembly adjacent the tire support means, the cutter assembly comprising:

(1) an elongated hollow housing,

(2) a shaft mounted for rotation in the housing and projecting longitudinally from one end thereof,

(3) a flywheel secured to the projecting end of the shaft for rotation therewith,

(4) a cutter blade mounted on the flywheel for rotation therewith,

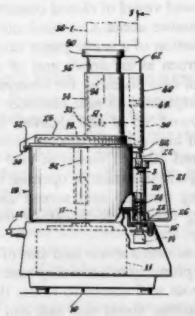
(5) a centrifugal fan mounted on the flywheel for rotation therewith and having an air inlet adjacent its center, and

(6) an opening through the flywheel communicating at its forward end with the air inlet of the fan and at its rearward end with the atmosphere.

4,216,917
SAFETY INTERLOCK FOR THE FOOD PUSHER IN A FOOD PROCESSOR

Richard D. Clare, and Carl G. Sontheimer, both of Greenwich, Conn., assignors to Cuisinarts, Inc., Greenwich, Conn.

Filed Nov. 13, 1978, Ser. No. 959,937
Int. Cl.[2] B02C 18/16
U.S. Cl. 241—37.5 30 Claims



1. In a food processor of the type including an electric motor drive in a housing with tool mounting means driven by the motor drive and control means in the housing for rendering the motor drive inoperative unless said control means is actuated,

a bowl mountable on said housing for enclosing a rotatable tool within said bowl and driveable by said mounting means, a removable cover for said bowl having actuation means thereon for actuating the motor drive only when the cover is properly positioned on the bowl, a food-receiving hopper on said cover and extending therethrough for feeding food items through the cover into the bowl and a food pusher manually insertable into said hopper for pushing the food items, the invention which comprises: safety interlock means operatively associated with said actuation means for actuating said control means only when said cover is properly positioned on said bowl and said pusher is inserted in said hopper for preventing the insertion of a hand or foreign object through the hopper into the bowl when the tool is being driven by the operative motor drive.

4,216,918

FIBERIZER

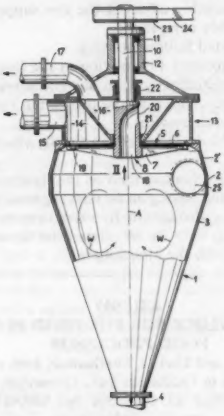
Albrecht Kahmann, Weingarten, and Wolfgang Siewert, Ravensburg, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Winterthur, Switzerland

Continuation of Ser. No. 805,183, Jun. 9, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 940,999

Claims priority, application Switzerland, Dec. 8, 1976, 15405/76

Int. Cl.[2] B02C *23/18, 23/10*

U.S. Cl. 241—46 B **8 Claims**



1. A fiberizer comprising

a vertically disposed vessel of closed construction defining a suspension chamber about a vertical axis having an inlet for the introduction of a waste paper suspension into said chamber, a screen at an upper end of said chamber to define a wall of said chamber for screening stock from a waste paper suspension in said chamber and a discharge opening at a lower end of said chamber for the discharge of impurities of high specific gravity from said chamber;

a housing mounted on said vessel at said upper end, said housing having a first discharge opening for the discharge of stock passing through said screen and a second discharge opening for the discharge of impurities of low specific gravity; and

a rotor rotatably mounted about said axis of said vessel, said rotor having a plurality of arms disposed in said chamber for moving across said screen to rotate the stock suspension in said chamber about said axis and to circulate the stock suspension in said chamber while comminuting the stock suspension, said rotor extending through said housing and having a central duct on said axis communicating said chamber with said second discharge opening in said housing for discharging impurities of low specific gravity.

4,216,919

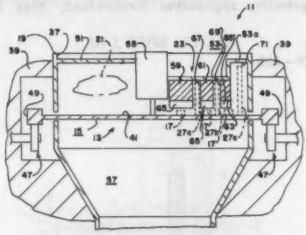
MACHINE FOR COMMINUTING CLAY STOCK

Ellis F. Trevathan, P.O. Box 66, Gleason, Tenn. 38229

Filed Apr. 11, 1979, Ser. No. 29,138

Int. Cl.[3] B02C *18/22*

U.S. Cl. 241—92 **10 Claims**



1. An improved machine for comminuting clay stock, said machine including a rotor means, said rotor means including a rotating body means and including a plurality of cutter blade means attached to said body means, said machine including a feed hopper means for directing clay stock onto said body means and including crowder means for crowding portions of said clay stock against said cutter blade means to cause particles of clay to be cut from said clay stock, wherein the improvement comprises: a plurality of upwardly extending lug means attached to said body means of said rotor means for rotation therewith; and a plurality of teeth means attached to said crowder means for coacting with said plurality of lug means to prevent any non-comminutable substance contained in said clay stock greater than a predetermined size from being crowded against said cutter blade means by said crowder means; a plurality of said lug means having a face surface; a plurality of said teeth means having a face surface, said face surface of said lug means being directed in the direction of rotation of said body means and sloping towards said body means, said face surface of said teeth means being directed opposite the direction of rotation of said body means and sloping towards said body means.

4,216,920

TURRET TYPE YARN WINDING APPARATUS

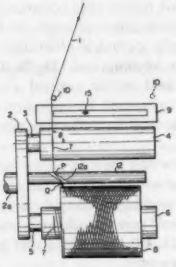
Nobuhiko Tambara, Ishikawa; Katsumi Hasegawa, Kusatsu, and Toshio Yasuda, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Feb. 26, 1979, Ser. No. 15,001

Claims priority, application Japan, Feb. 28, 1978, 53-21536

Int. Cl.[3] B65H *54/02, 67/04*

U.S. Cl. 242—18 A **12 Claims**



1. In a turret type yarn winding apparatus comprising a turnable turret on which a plurality of spindles for holding a respective bobbin are rotatably mounted, means for rotating

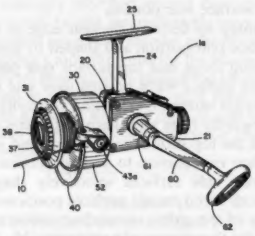
said spindles, a traverse mechanism for traversing a feeding yarn upstream of said spindles in an axial direction thereof, means for turning said turret to alternately exchange the positions of bobbins held by said spindles between a winding position and a stand-by position, an improvement comprising, in combination, a yarn shifting guide for shifting a running yarn fed to a yarn package along a longitudinal axis of said spindle with a range through both positions outside and inside a range of traverse motion of said traverse mechanism, yarn catching means being rotatable together with said spindle, and means for regulating a yarn passage of said running yarn between said yarn shifting guide and said yarn package after said yarn package is moved from said winding position, to form a predetermined yarn passage comprising an upstream portion under said yarn shifting guide, an intermediate portion and a downstream portion between a downstream terminal of said intermediate portion and said yarn package, said upstream portion located at a position where said yarn catching means is capable of catching said yarn, said downstream terminal of said intermediate portion located at a position within a range of a traverse motion of said traverse mechanism.

4,216,921

FISHING REEL SPOOL LOCKING DEVICE

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,842
Int. Cl.² A01K *89/01*
U.S. Cl. 242—84.2 R **2 Claims**



1. In an open face spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing, a center shaft mounted in the housing, a spool mounted on the shaft for holding the fishing line, a handle and gear train assembly mounted in the housing, a rotor coaxially mounted on the shaft and rotatable by cooperative movement of the handle and assembly, and a movable bail mounted on the rotor having an open casting position and a closed retrieving position, the improvement comprising:

(a) a spool having a hub and front and back flanges mounted concentrically with the hub, and a center concentric hole passing therethrough, the hub having an undercut front face and an undercut back section each surrounding the center hole, the distance from the undercut back section of the hub to the front undercut face of the hub being A, the spool having a groove undercut into the undercut back section a depth B and the groove being transverse the hole and extending radially therefrom, the distance from the groove to the front face of the hub being A-B,

(b) a retainer knob having a central threaded portion, the retainer rotatably mounted on the spool and retained by the front flange with the threaded portion in axial alignment with the center hole,

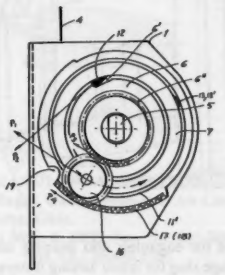
(c) the shaft having a forward threaded end, a pin passing through said shaft, a distance X from the pin to the forwardmost thread being less than A and being greater than the distance A-B, to lock the spool to the shaft, the spool must be rotated permitting the pin to fit into the groove enabling the threaded portion on the knob to engage the threaded end of the shaft.

4,216,922

DEVICE FOR REDUCING SPRING TENSION IN A BELT STRAP

Per O. Weman, Heverlee, Belgium, assignor to N.V. Klippan S.A., Heverlee-Leuven, Belgium

Filed Jul. 11, 1978, Ser. No. 923,603
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2732876
Int. Cl.² A02B *35/02*; B65H *75/48*
U.S. Cl. 242—107 **19 Claims**



1. A vehicle safety belt retractor comprising:

a stationary retractor housing;

a shaft rotatably mounted in said housing about a shaft axis;

seat belt webbing adapted to be wound about said shaft;

a single rewind spring connected to said shaft and biasing said shaft in a rewind direction with a first rewind force, said rewind spring being under tension and exerting a torque acting on said housing in a belt extending direction of a first extension magnitude; and

tension relieving means actuable upon retraction of said webbing following protraction of said webbing and operable during a limited amount of additional protraction of said webbing, said tension relieving means comprising means to divide said torque acting on said housing into at least two components each having an extension force magnitude less than said first extension magnitude, said means to divide comprising a rotatable gear acting directly against said housing, and means to couple one of said lesser extension forces to said rewind spring so as to counteract the bias of said spring, thereby providing a net rewind force acting on said shaft which is lower than said first rewind force.

4,216,923

TARGET TYPE THRUST REVERSER

Alfred W. Harris, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Continuation-in-part of Ser. No. 782,804, Mar. 30, 1977. This application May 9, 1978, Ser. No. 904,142
Int. Cl.² B64C *15/08*; F02K *3/02*; B64D *33/04*
U.S. Cl. 244—110 B **17 Claims**

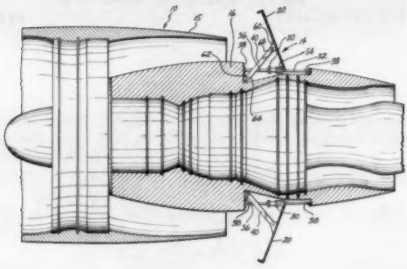
1. In an aircraft engine including a turbine housing, a forward fan, a fan air duct surrounding said fan and said housing and extending rearwardly along said housing for a distance less than the axial length of said housing, thrust reversing apparatus comprising:

a plurality of reverser doors mounted circumferentially around the exterior surface of said turbine housing downstream of said fan air duct, each said reverser door including an upstream end and a downstream end;

linkage means including a plurality of linkage members each having a first end pivotally mounted to said housing and a

second end pivotally attached to one of said reverser doors substantially intermediate said upstream and said downstream ends thereof;

a carriage ring disposed around said housing, said carriage ring comprising a plurality of rigid segments, each of said segments being pivotally attached to its adjacent segment and forming bearing means for supporting said carriage ring and said carriage ring being pivotally connected at a plurality of circumferentially spaced-apart locations to said downstream ends of said reverser doors whereby stress concentrations in said ring are minimized;



guide means for engaging said bearing means and guiding said carriage ring for linear sliding movement with respect to said housing along said guide means; and

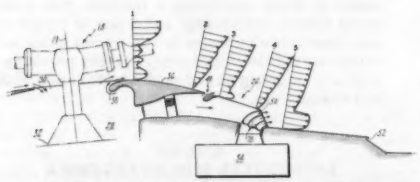
actuation means for selectively moving said carriage ring along said guide means, said reverser door moving radially outwardly with respect to said housing between an extended position in the path of fan air from said fan air duct and a retracted position in response to said movement of said carriage ring.

4,216,924

HELICOPTER

Evan A. Fradenburgh, Fairfield, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 20, 1978, Ser. No. 971,161
Int. Cl.[2] B64C *27/04*
U.S. Cl. 244—17.11 **15 Claims**



1. A helicopter having longitudinal, lateral and vertical dimension and operable to fly in conventional attitude to establish helicopter forward flight direction in cruise mode and comprising:

(A) a fuselage defining:

(1) a nose section at its longitudinal forward end,

(2) a tail section spaced longitudinally rearwardly of the nose section and,

(3) a main rotor pylon positioned longitudinally between the nose section and tail section and extending vertically thereabove, said main rotor pylon being shaped to define a rotor head well therewithin at its longitudinally forward end, and including:

(a) a top surface having:

(1) a forward portion defining the top of the rotor head well,

(2) a central portion smoothly connected to the forward portion,

(3) a rear portion positioned vertically lower then the central portion and extending substantially in the direction of helicopter forward flight,

(4) a rotor head well aperture extending through said top surface forward portion to place the rotor head well into communication with atmosphere, said aperture having a selectively curved lip along the rearward side thereof extending from said top surface into said rotor head well so that air being discharged from said rotor head well during forward flight will flow along the curved lip and be discharged rearwardly parallel to and along the top surface central portion,

(5) a boundary layer control slot positioned in said top surface central portion a selected distance rearwardly of said rotor head well aperture curved lip and extending laterally along said top surface central portion and shaped to define a converging nozzle positioned to place the pylon interior into communication with atmosphere and so that fluid passing through said boundary layer control slot will be discharged therefrom rearwardly parallel to and along said top surface central portion

(6) an exhaust port extending laterally along and vertically between said top surface central portion and said top surface rear portion and placing the pylon interior into communication with atmosphere and shaped to discharge fluid from the pylon interior rearwardly therethrough parallel to and along said top surface rear portion,

(7) a sharp lip defining the rear edge of said pylon top surface rear portion and shaped to separate the fluid passing along said top surface rear portion from the pylon surface when passing over said sharp lip,

(8) a pylon extension extending vertically inwardly and rearwardly from said sharp lip to form an acute angle with the top surface rear portion and joining the top surface rear portion to said tail section,

(9) pylon side surfaces selectively shaped to define smooth aerodynamic surfaces positioned on opposite sides of the pylon top surface and extending downwardly therefrom and being smoothly joined at their forward ends and diverging laterally outwardly in a rearward direction to partially define the rotor head well and engine inlets and then converging laterally inwardly to smoothly join to the pylon extension

(B) a helicopter rotor extending from said rotor head well through said rotor head well aperture for operation at a station vertically above the fuselage,

(C) means to discharge fluid rearwardly through said boundary layer control slot along said pylon top surface central portion, and

(D) means to discharge fluid rearwardly through said exhaust port along said pylon top surface rear portion.

4,216,925

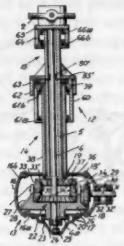
HELICOPTER OF THE TYPE HAVING TWO COAXIAL COUNTERROTATING ROTORS WITH A DRIVE MECHANISM INTERPOSED BETWEEN THE POWER PLANT AND THE ROTORS

Vicente Mendiberri, Rosario 84 - Capital, Buenos Aires, Argentina

Filed Oct. 13, 1978, Ser. No. 951,141
Claims priority, application Argentina, Oct. 18, 1977, 269629
Int. Cl.[3] B64D *35/06*
U.S. Cl. 244—60 **6 Claims**

1. A helicopter of the type having a power plant, two coaxial counterrotating rotors, and a drive mechanism interposed between the power plant and the rotors, said power plant having a power output shaft, wherein said drive mechanism comprises a differential mechanism having a power input shaft

coupled to said power output shaft of the power plant and two power output axles including a first output axle drivingly coupled to an upper one of said rotors and a second output axle drivingly coupled to a lower one of said rotors, couplings for coupling said output axles to corresponding ones of said upper and said lower rotors only one of said couplings between said power output axles and the corresponding rotor comprising a rotation inverting mechanism, said rotation inverting mechanism comprising a fixed external axle housing surrounding said second power output axle, a head block mounted on the upper end of said axle housing, a central crown gear mounted on said head block and having a striated central aperture in which is



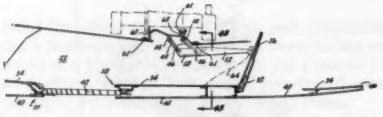
fitted the upper end of said second power output axle having a correspondingly striated outer surface, a plurality of satellite gears freely rotatingly mounted on said head block with their teeth meshing with the teeth of said central crown gear, an annular gear rotatingly mounted around the outer surface of said head block and having internal teeth meshing with the teeth of said satellite gears, said annular gear projecting downwardly and forming a mounting hub for the blades of the lower rotor, a plurality of through slots having the shape of an arc of a circle provided in said head block, each through slot being located between a pair of adjacent ones of said satellite gears and being used to permit control members for the upper rotor to pass therethrough.

4,216,926

LINKAGE SYSTEM FOR A TURBO FAN ENGINE THRUST REVERSER

Dale W. R. Lawson, Bonita, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jun. 30, 1978, Ser. No. 920,739
Int. Cl.[2] B64D *33/04*
U.S. Cl. 244—110 B **5 Claims**



1. A pre-exit thrust reverser for reversing the rearward flow of exhaust gases from a thrust producing jet aircraft engine, said engine being enclosed by a streamlined nacelle, said nacelle having a forward fixed section and a translatable rearward section comprising:

a plurality of blocker doors pivotally attached to said translatable section and rotatable between a stowed position wherein said doors are nested in said translatable section out of the exhaust flow and a deployed position wherein said doors divert the rearward flow of engine gases through peripheral outflow passages formed between the nacelle sections when said rearward nacelle section is translated rearward;

means for rotating each of said plurality of blocker doors between said stowed and deployed positions comprising first, second and third link members, said first link member pivotally attached at one end to fixedly positioned engine structure and pivotally connected to one end of said second link member at its other end, said second link member pivotally attached at one end to one of said blocker doors, said third link member pivotally attached at one end to said fixedly positioned structure adjacent said first link attachment to said fixedly positioned structure and at its other end to said second link member intermediate the ends of the second link member; and

means for translating said rear nacelle section,

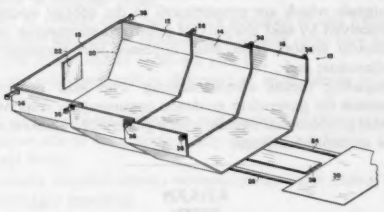
said second link member translates while pivoting about said first and third link members and said blocker door connection when said blocker doors rotate between said stowed and deployed positions.

4,216,927

BAGGAGE HANDLING AND STORAGE SYSTEM

Chester L. Byrd, Beggs, Okla., assignor to Air Cargo Equipment Corporation, Tulsa, Okla.

Filed Mar. 6, 1978, Ser. No. 883,388
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—118.1 **6 Claims**



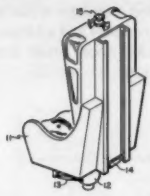
1. Apparatus for handling and storing baggage or cargo within an aircraft fuselage having door means in said fuselage to allow loading and unloading; comprising a plurality of storage platforms for operation with said fuselage, each platform consisting of a flat rectangular base and two side walls extending upwardly from the two edges of said base adjacent said fuselage, said side walls juxtaposed to the shape of said fuselage, said platforms, when unloaded, being stacked one atop another over a fixed position adjacent said fuselage door means and having at least an uppermost platform and a lowermost platform; roller means to allow longitudinal movement of each platform relative to said aircraft fuselage; and means for moving each platform away from and back towards said fixed position in a telescoping sequence such that the uppermost platform will move away from said stack first and such that the lowermost platform will always return to said stack first; whereby the uppermost platform is loaded first and when loaded is moved away from said fixed position to permit loading of the next lower platform; whereby said platforms are loaded serially commencing with the uppermost platform and ending with the lowermost platform; whereby, as each platform below said uppermost platform is loaded and moved away from said fixed position, all of the previously loaded platforms are moved further away from said fixed position until said lowermost platform is loaded; whereby, after said lowermost platform is loaded, all of said platforms in fully extended telescoped condition are moved away from said fixed position to permit loading over said fixed position and in the area of said fuselage door means.

4,216,928

MICROWAVE RADIOMETRIC ATTITUDE REFERENCE SYSTEM

John O. Hooper; W. James Stone, and Vernon D. Burklund, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1978, Ser. No. 892,054
Int. Cl.[2] B64D 25/10
U.S. Cl. 244—122 AD 9 Claims



6. An attitude reference system for use in guiding a vehicle, comprising:

an antenna cluster having a plurality of polarized microwave radiometric sensors configured to receive energy from at least three different coplanar directions which define a base plane and from at least one direction perpendicular to said base plane;

processing means communicating with said plurality of polarized microwave radiometric sensors for generating signals which are proportional to the energy intensities received by said plurality of polarized microwave radiometric sensors from each coplanar and perpendicular direction; and

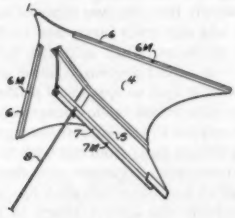
computing means communicating with said processing means for generating guidance commands in response to said proportional signals, which guide said vehicle toward a predefined attitude.

4,216,929

KITES

Raymond P. Holland, Jr., Roswell, N. Mex., assignor to The Holland Corporation, Roswell, N. Mex.

Filed Jul. 17, 1978, Ser. No. 925,500
Int. Cl.[2] B64C 31/06
U.S. Cl. 244—153 R 6 Claims



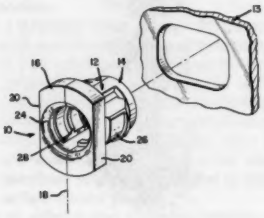
1. A kite comprising a pliable lifting sail; a structural wing spar sloping outwardly and rearwardly on one side of said kite, lying along a substantial portion of the leading edge of said sail on that side of said kite; a generally quadrilateral pliable keel attached along its upper edge to said sail, the upper edge of said keel being concave upwardly, the length of the lower edge of said keel being longer than the greatest width top-to-bottom of said keel; a stiff keel support beam attached along the lower edge of said keel, the center of length of said keel support beam lying substantially rearward of the center of length of the structural wig spar lying along one side of the leading edge of said sail; and a flying line attached to said keel support beam at a point forward of the midpoint of said beam and rearward of the front end of said beam.

4,216,930

STRAIN RELIEF

Frederick W. Rossler, Jr., New Port Richey, and Gerald M. Anderson, Clearwater, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 24, 1978, Ser. No. 936,444
Int. Cl.[2] F16L 5/00
U.S. Cl. 248—56 12 Claims



1. A cable strain relief for retaining a cable in an apertured panel comprising:

a cylindrical body dimensioned to be received into said aperture and having a cable receiving passage extending therethrough,

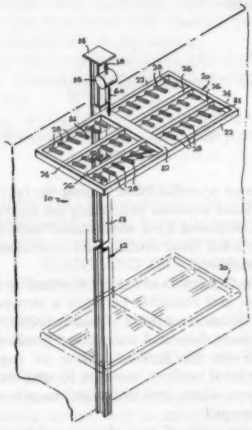
at least two opposite facing cantilever members integral with said cylindrical body and disposed immediate to said cable receiving passage, each of said cantilever members having an exterior surface which extends beyond the exterior surface of said cylindrical body, whereby said cantilever members upon contacting the panel defining said aperture are moved inwardly to reduce the dimension of said cable receiving passage.

4,216,931

DRYING RACK FOR FIRE HOSE

Clarence E. Harless, and Jessie C. Tiger, both of 2101 H St., Bakersfield, Calif. 93301

Filed Jan. 29, 1979, Ser. No. 7,336
Int. Cl.[2] A47G 29/00
U.S. Cl. 248—89 7 Claims



1. An apparatus for drying fire hoses comprising a vertical support, a hoist, at least a portion of the hoist mounted at least

near the upper ends of the vertical support, a platform rack moveably mounted on said vertical support, a support bar on the platform rack, means connecting at least a portion of the hoist with the support bar, hoist control means connected to at least a portion of the hoist for raising and lowering the platform rack, said platform rack comprising a surrounding rectangular framework of protective guide rails including parallel side and parallel end guide rails, said support bar connected between parallel protective side rails, connecting bars parallel to said side rails and connected between the end protective rails and to the support bar, hose support pegs surrounded by parallel side and end guide rails mounted in spaced parallel relationship to each other and to the end protective rails and connected at only one end to a side protective rail or a connecting bar and projecting toward but not reaching a protective guide bar or rail to define an elongated hose receiving guide space, the space between the adjacent hose support pegs larger than the diameter of the fire hoses so the fire hoses can be bent and draped over the hose support pegs, said hose support pegs the same length, the guide space between the free ends of the hose support pegs and the adjacent connecting guide bars or protective rail large enough so when a fire hose is bent the bent portion can be inserted in said space in a plane transverse to the direction of projection of the hose support pegs and draped over one or more hose support pegs depending on the effective radius of curvature of the bent portion of the fire hose but small enough so the adjacent protective or connecting guide bars or rails serve to engage and guide any hose falling off the hose support pegs so they fall to the ground directly below the platform rack.

4,216,932

STAND FOR SUPPORTING A SIGN OR SIGNHOLDER

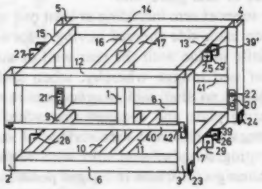
Hermann Silbernagel, Uhlandstrasse 7, 6800 Mannheim 1, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 900,525

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 7714522[U]

Int. Cl.[2] F16M *11/26*; G09F *1/10*

U.S. Cl. 248—156 **19 Claims**



1. A stand for supporting one of a sign and a signholder, comprising a parallelopiped-shaped welded frame having corner posts and of a plurality of square tubes and a plurality of elongated members, wherein one of said plurality of square tubes is arranged vertically in the center of said frame,

and further comprising a plurality of iron plates welded to the corner posts of said frame, said plates projecting downwardly beyond said corner posts, and

wherein the corner posts of said frame are formed by said plurality of square tubes, and said stand further comprises:

a plurality of additional square tubes, said additional tubes inserted into said plurality of square tubes forming said corner posts, said additional square tubes having a smaller cross-section than said plurality of square tubes and each closed on one end with an iron plate projecting beyond the edges thereof;

a plurality of other iron plates, each welded to one side of one of said corner posts, each other iron plate and its respective corner post containing at least one threaded hole and respective mating screw, wherein each of said plurality of additional square tubes inserted within its respective corner post is held securely at any position along its length by means of said screw inserted into its respective at least one threaded hole.

4,216,933

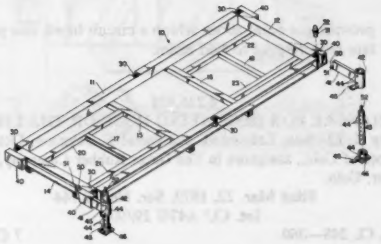
PORTABLE SCAFFOLD SUPPORT BASE

Milton A. Cramer, Jr., 4608 Falcon St., Rockville, Md.

Filed Mar. 6, 1979, Ser. No. 17,975

Int. Cl.[3] F16M *11/26*; E06C *5/04*

U.S. Cl. 248—188.5 **5 Claims**



1. A portable scaffold support base comprising,

a rigid rectangular frame,

a pair of tubular cross bars rigidly attached to said frame in parallel and spaced relation, said tubular cross bars being open at one end to receive a fork lift,

tubular outrigger collars disposed at each corner of said frame,

outrigger members slidable in said collars and adapted to be adjustable to form horizontally disposed extensions from said frame,

vertically disposed sleeves mounted on the outer ends of said outrigger members,

vertically disposed support legs slidably received in said sleeves,

means for locking said support legs in selected position in said sleeves,

and means for attaching a scaffold mounted on said frame, whereby said frame may be supported in a horizontal plane with said outrigger members extended horizontally selected distances and said support legs extended vertically selected distances to provide support on the best available surface.

4,216,934

UNIVERSAL MOUNTING BRACKET FOR CIRCUIT BLOCKS

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Filed Mar. 6, 1978, Ser. No. 883,888

Int. Cl.[2] A47F *7/00*

U.S. Cl. 248—309 A **10 Claims**

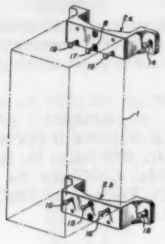
1. A mounting bracket for use in affixing circuit blocks to a surface, the bracket comprising:

(a) a block supporting beam for supporting a circuit block;

(b) mounting means for attaching said block supporting beam to the surface, and;

(c) pendulating means on said block supporting beam, said

pendulating means comprising at least a first protrusion having an arcuate support surface, said support surface



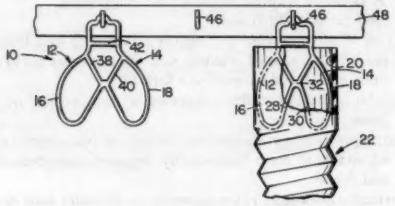
providing a point about which a circuit block can pendulate with respect to said beam.

4,216,935

HANGER FOR DISPLAYING HOSE OR THE LIKE

Jerry K. Ellefson, Lakewood, and David E. Johnson, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 22, 1979, Ser. No. 22,744
Int. Cl.[3] A47G *29/00*
U.S. Cl. 248—360 **7 Claims**



1. A hanger for suspending hollow articles, especially of tubular shape, comprising:

a pair of resilient legs juxtaposed from one another, each leg including a retention portion at the side extremity of the leg for frictionally engaging the inner wall of the hollow article, and a bracing portion of each leg for limiting movement of the legs and interconnected at a juncture;

strut means interconnecting the retention portion of a leg with its corresponding bracing portion, for limiting deformation of the leg upon application of a deflective force; and

a hanger portion connected to the respective legs adapted for mounting the hanger on a support.

4,216,936

BACK FOR PICTURE FRAME

Dean B. DeSelms, 7001 Pierce, Arvada, Colo. 80003

Filed Jun. 2, 1978, Ser. No. 911,838
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—460 **4 Claims**

1. A supporting easel for supporting a picture frame or the like comprising:

(a) a mounting plate having means for attaching said plate to a frame;

(b) said plate having a front and a rear surface, a center section and side sections and a top and bottom;

(c) said center section being offset from said side sections so that said sections form a channel;

(d) said plate having at least three slots in said center section extending from the top to bottom thereof;

(e) a one piece support arm having sides, a base support end and a slot engaging end;

(f) said slot engaging end including a pair of spaced tongues;

(g) said tongues being hook-shaped and opening upwardly;

(h) said tongues being spaced from each other a distance substantially equal to the distance between said slots;

(i) said tongues being in a height and width substantially equal to the height and width of said slots;

(j) said tongues having an engaging portion for engaging said mounting plate including a rear wall;

(k) said engaging portion being in thickness substantially that of said plate so that when said tongues are inserted into said slots, and said mounting plate moved downwardly with respect to said tongues, said engaging portion will engage with said plate in a snug fit relationship;

(l) said center section, relative to said side sections, being offset a distance sufficient to provide clearance for said

tongues between said picture frame and said center section;

(m) said support arm being planar, having said base support and said slot engaging end lying in said plane, and of a thickness substantially equal to said plate thickness;

(n) said support arm being angularly positioned with respect to said tongues so that when said arm is positioned in said plate, said arm is inclined downwardly from said rear surface of said plate; and

(o) said support arm including at least one stabilizing projection on each side thereof having a forward surface substantially in line with the rear wall of said engaging portion of said tongue whereby, when said support arm is positioned so that said tongues are in said slot in said mounting plate and engaged therewith, said projections will engage with said rear surface of said plate thereby preventing sway of said arm with respect to said plate maintaining said frame in a rigid position.

4,216,937

HEAT EXCHANGER MOUNTING DEVICE

David G. Bridgnell, Rolling Hills, and Frederick W. Jacobsen, Los Angeles, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

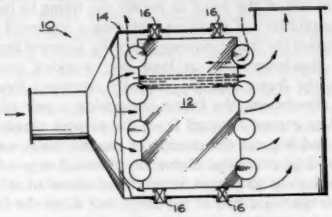
Division of Ser. No. 447,906, Mar. 4, 1974. This application Jul. 18, 1975, Ser. No. 597,049
Int. Cl.[2] F28F *7/00*; F16F *15/04*
U.S. Cl. 248—562 **10 Claims**

1. A mount for supporting a heat exchanger core within a housing comprising:

at least one layer of metallic hollow core structure means for floatably supporting said core within the housing;

support means cooperative with said structure means;

means for releasably attaching an outer end of said mount to the housing; and



means affixing an inner end of said metallic hollow core structure against the core.

4,216,938

SOLENOID ACTUATED VALVE DEVICE

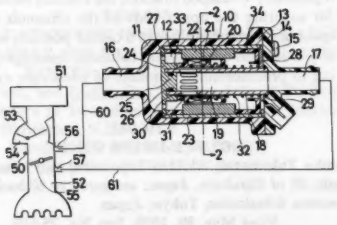
Masami Inada, Kariya; Takeharu Ohumi, Toyota, and Masaru Tsunekawa, Fujioka, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 8, 1978, Ser. No. 932,077

Claims priority, application Japan, Aug. 18, 1977, 52-98929; Nov. 22, 1977, 52-140140; Nov. 24, 1977, 52-140916; Nov. 24, 1977, 52-157579[U]

Int. Cl.² F16K *31/08*

U.S. Cl. 251—65 **15 Claims**



1. A solenoid actuated valve device for electrically controlling the flow of fluid comprising;

a body member having at least a portion thereof made of magnetic material, said body member having a pair of ports thereon and defining an internal chamber in communication with one of said ports,

a core made of magnetic material axially positioned in said internal chamber, said core comprising a cylindrical wall member defining a central hollow portion therein in communication with the other of said ports, said magnetic material portion of said body member and said core forming a magnetic circuit,

a bobbin made of non-magnetic material slidably mounted on said core,

a solenoid coil wound on said bobbin,

permanent magnet means positioned in said body member so that the magnetic flux thereof may intersect at right angles to the winding of said solenoid coil,

radial passage means formed through the cylindrical wall member of said core in order to provide communication between said hollow portion and said internal chamber,

valve means operatively associated with said bobbin and having an internal surface thereof disposed in sliding engagement with the outer surface of said core for opening and closing said passage means in response to movement of said bobbin, and

spring means biasing said bobbin so that said sliding valve may close said passage means.

4,216,939

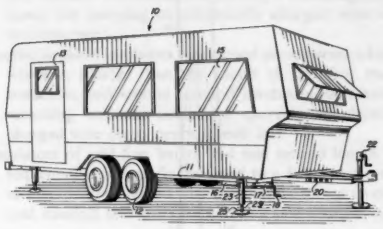
RECREATIONAL VEHICLE LEVELING AND SUPPORT SYSTEM

Joseph M. Valdespino, 5023 Golf Club Pkwy., Orlando, Fla. 32808

Filed Sep. 20, 1978, Ser. No. 943,916

Int. Cl.² B66F *7/26*

U.S. Cl. 254—45 **11 Claims**



1. A recreational vehicle leveling and support system comprising in combination:

a master fluid cylinder having a piston located therein and having a piston rod attached to said piston and being at least partially filled with a fluid, said master fluid cylinder having a chassis mounting bracket attached thereto for removably attaching said master fluid cylinder to the chassis of a recreational vehicle;

a plurality of fluid lifting cylinders attached to a recreational vehicle and positioned in spaced relationship to each other, each of said plurality of fluid lifting cylinders having a chassis mounting bracket attached thereto for removably attaching each said fluid cylinder to a recreational vehicle chassis;

drive means coupled to said master cylinder for pushing and pulling said master cylinder piston rod and piston when said drive means is actuated, said drive means having a threaded shaft rotatable for actuating said drive means for pushing or pulling said master cylinder piston and an electric motor connected to said threaded shaft for rotating said shaft for actuating said pushing and pulling of said master cylinder piston and also having a removable hand crank removably attachable to said threaded shaft for rotating said shaft for pushing and pulling said piston of said master fluid cylinder, and said drive means having a main casing having a flange fixedly attached thereto and said master fluid cylinder having a flange formed thereon for removably attaching to the flange on said drive means main casing; and

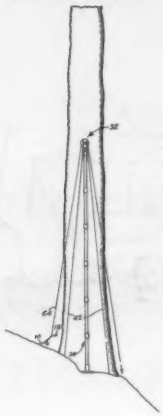
fluid control means to control the flow of fluid between said master cylinder in each fluid lifting cylinder for controlling the flow of fluid between said master cylinder and each of said plurality of lifting cylinders to raise or lower a portion of said recreational vehicle responsive to the actuation of said master cylinder by said rotatable drive means, said fluid control means having a plurality of fluid valves mounted adjacent each other and adjacent one end of said drive means, whereby said fluid control means and drive means can be actuated from a single location, whereby a recreational vehicle can be supported or leveled with said lifting cylinders.

4,216,940

DIRECTIONAL TREE FALLING AID AND METHOD OF APPLYING SAME

Kenneth E. Martin, P.O. Box 34, Skamokawa, Wash. 98647

Filed Apr. 24, 1979, Ser. No. 32,896
Int. Cl.³ B66C *23/60*
U.S. Cl. 254—390 **7 Claims**



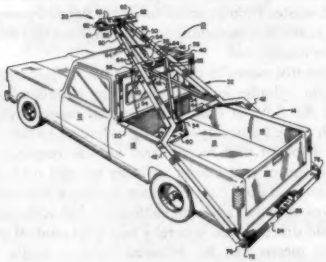
1. A directional tree falling aid comprising in combination:
(a) a logging choker including
(1) a flexible cable,
(2) a coupler slidably mounted intermediate the ends of the cable,
(3) first connecting means on one end of the cable for connecting said one end to the coupler in cable-looping arrangement around a tree to be felled, and
(4) second connecting means on the other end of the cable for connecting it to a logging pulling line and
(b) a choker-elevating pole assembly comprising
(1) a pole adapted to be positioned vertically alongside the tree with its upper end in close proximity to the tree trunk and
(2) a substantially vertically arranged sheave means fixed to the upper end of the pole and dimensioned to receive the cable in running engagement.

4,216,941

YOKE HOIST FOR USE WITH PICKUP TRUCK

Raymond L. Little, 1723 Oak Lake, Irving, Tex. 75060

Filed May 22, 1978, Ser. No. 907,987
Int. Cl.² B66C *23/60*
U.S. Cl. 254—326 **4 Claims**



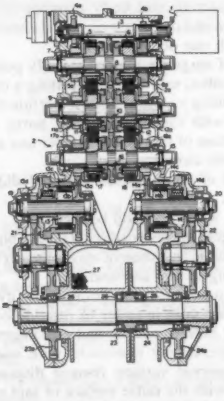
1. A hoist assembly for use with a conventional pickup truck or the like having a cargo bed partially enclosed by upstanding sidewalls, the hoist assembly comprising:
a generally yoke-shaped frame pivotally attached to the rearward end of the truck to permit the frame to be carried in a plurality of positions including a transport position wherein the frame extends generally forward from its pivotal attachment and at least one working position wherein the frame extends generally rearward from its pivotal attachment, the frame comprising a pair of legs adapted to extend forward from the pivotal attachment around and beyond the outside of the sidewalls whereupon the legs converge above the forward area of the cargo bed so as to permit access from above to at least about the rearward half of the cargo bed when the frame is in the transport position, the frame further including means at the upper end thereof for attaching a pulley and means for bracing the upper ends of the legs;
means for suspending the frame in the working position to permit hoisting of the objects at the rear of the truck; and
a bumper bar secured to the rearward end of the truck and means for pivotally attaching the frame to the outermost ends of the bumper bar;
and wherein:
the frame is generally symmetrical about the longitudinal axis of the truck and lies in a plane pivotable about the longitudinal axis of the bumper bar;
the pulley attaching means comprises telescoping channels adapted to slidably extend from upper converging portions of the frame legs to permit selective adjustment of the overall length of the frame; and
the telescoping channels are secured at their upper ends by a generally U-shaped bracket, the bracket including means for securing the upper ends of the channels at balanced spacings from both sides of a center position of the generally U-shaped bracket, said balanced spacings corresponding to predetermined amounts of telescopic extension.

4,216,942

DOUBLE-DRUM WINCH

Takehiko Takamatsu; Akihiro Toyomura, and Masami Hashimoto, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 30, 1979, Ser. No. 25,610
Claims priority, application Japan, Mar. 31, 1978, 53/36585
Int. Cl.² B66D *1/26*
U.S. Cl. 254—310 **4 Claims**



1. A double-drum winch having a hook drum and a boom drum mounted therein comprising a winch frame;
prime mover means fixedly mounted on said frame;
a drive shaft rotatably mounted on said frame, said drive

shaft being connected with and rotated by said prime mover means;

a first clutch shaft rotatably mounted on said frame, said first clutch shaft having a first gear fixedly secured thereon, a high speed clutch mounted thereon and a low speed clutch mounted thereon, said high and low speed clutches being mounted oppositely relative to said first gear;

a second clutch shaft rotatably mounted on said frame, said second clutch shaft having a second gear engageable with said first gear fixedly mounted thereon, a hook lowering clutch mounted thereon and a boom lowering clutch mounted thereon, said hook and boom lowering clutches being mounted oppositely relative to said second gear;

a third clutch shaft rotatably mounted on said frame, said third clutch shaft having a third gear engageable with said second gear fixedly mounted thereon, a hook hoisting clutch mounted thereon and a boom hoisting clutch mounted thereon, said hook and boom hoisting clutches being mounted oppositely relative to said third gear;

a hook brake shaft rotatably mounted on said frame, said hook brake shaft having hook brake means mounted thereon and being selectively connectible for rotation with said second and third clutch shafts;

a boom brake shaft rotatably mounted on said frame, said boom brake shaft having boom brake means mounted thereon and being selectively connectible for rotation with said second and third clutch shafts; and

a drum shaft fixedly mounted on said frame, said drum shaft having the hook drum and the boom drum rotatably mounted thereon, said hook drum being connected with said hook brake shaft and said boom drum being connected with said boom brake shaft.

4,216,943

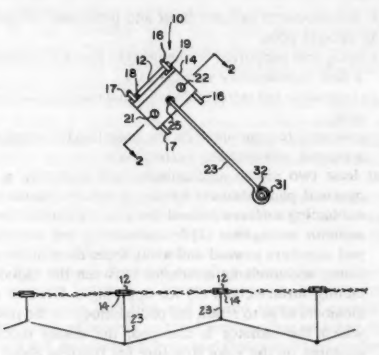
VERSATILE STANDOFF INSULATOR AND CHARGED FENCE ARRAY FOR MOUNTING ON CHAIN LINK FENCES AND ELSEWHERE

George F. Pope, and Evelyn O. Childress, both of Burlington, N.C., assignors to Diversified Manufacturing & Marketing Co., Inc., Burlington, N.C.

Filed May 3, 1978, Ser. No. 902,527

Int. Cl.³ A01K *3/00;* H01B *17/16, 17/24*

U.S. Cl. 256—10 **6 Claims**



1. A standoff insulator for a charged fence wire or the like adaptable for mounting on chain link fences or the like and other surfaces, comprising: a first insulator block and a second insulator block, said first and second insulator blocks being mountable together by a fastening means, said first and second blocks being shaped to form first and second substantially parallel recesses a pre-determined distance apart along a junction formed by the two insulator blocks, said first and second substantially parallel recesses being adapted for mounting the two insulator blocks upon the links of a chain link fence, said first and second blocks also being provided with mounting holes whereby said blocks may alternatively be fastened to other surfaces, at least one of said blocks being provided with thread means substantially centrally located between said substantially parallel recesses, and a standoff rod fastenable to at least one of said insulator blocks and being providable with means to apply a retaining force against the other of said insulator blocks.

5. An arrangement for forming an electrically charged array mounted on a fence, comprising:

first standoff insulators of a first pre-determined length, said first standoff insulators each having a mounting end and means for carrying an electrically charged wire on its opposite end;

second standoff insulators of a second pre-determined length which is shorter than the length of said first standoff insulators, said second standoff insulators each having a mounting end and means for carrying an electrically charged wire on its opposite end; and

insulators of said first length and said second length being sequentially alternately mounted to a fence and carrying an electrically charged wire through the means on each of said standoff insulators for carrying said charged wire.

4,216,944

CASTING VESSEL HAVING BASIC LINING

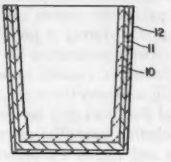
Noburo Shimada, Tokyo; Akira Miyamoto, Kawasaki; Motonobu Kobayashi, Yokohama; Akio Kuribayashi, Tokyo; Takeharu Toyoda, Yokohama; Morihiro Kimura, Tokyo; Hiroshi Kyoden, Okayama; Toshisuke Hoshino, and Jiro Watanabe, both of Bizen, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Shinagawa Shiro Renga Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 882,818, Mar. 2, 1978. This application Dec. 13, 1978, Ser. No. 968,913

Claims priority, application Japan, Mar. 2, 1977, 52-21470

Int. Cl.² C21C *7/00*

U.S. Cl. 266—44 **7 Claims**



1. In a method of casting a molten metal from a casting vessel, the vessel comprising: (i) an iron shell having an outer surface and an inner surface, (ii) a backing having an outer surface and an inner surface, the outer surface of the backing being positioned on, and supported by, the inner surface of the iron shell; and (iii) a basic lining having an outer surface and an inner surface, the outer surface of the basic lining being positioned on, and supported by, the inner surface of the backing, the method comprising preheating said casting vessel, charging the molten metal into the heated casting vessel and discharging the molten metal therefrom, the improvement comprising:

(a) heating the inner surface of the basic lining to at least 500° C. before charging the molten metal into the casting vessel;

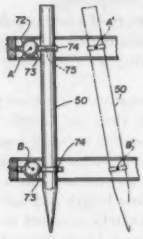
(b) having the backing comprise a cushion material having a thickness between 7 mm and 50 mm and a compression deformability greater than 10% at 10 kg/cm^2; and

(c) having the thickness of the basic lining between 70 mm and 300 mm, the thickness of the basic lining being at least twice the thickness of the cushion material.

4,216,945
APPARATUS FOR AUTOMATICALLY CONTROLLING THE CUTTING OF PIPES, PLATES AND THE LIKE

Adrian H. Krieg, Yorktown, N.Y., assignor to Widder Corporation, Naugatuck, Conn.

Continuation of Ser. No. 702,077, Jul. 2, 1976, abandoned. This application Jan. 19, 1979, Ser. No. 4,882
Int. Cl.[2] B23K *7/04, 7/10*
U.S. Cl. 266—56 11 Claims



1. Apparatus for cutting, welding or otherwise working pipe, sheet, plate or similar workpiece comprising a carriage movable in the first axis parallel to the surface of said workpiece, a motor for driving said carriage, bracket means mounted on said carriage for reciprocal movement in a second axis angular to the first axis and parallel to the surface of said workpiece, a second motor for driving said bracket means, a tool, means for mounting said tool on said bracket means comprising a pair of spaced rotatable rings with a third axis perpendicular to said first and second axes, said tool being mounted by universally movable fastening means to each of said rings, motor means for individually rotating said rings about said third axis, control means for simultaneously operating the individual motor means to cause said tool to work said workpiece along a combined selected path parallel to the surface, said selected path being the function of a mathematical formula in terms of the coordinate paths of the first and second axes having fixed parametric values, said control means comprising a computer for storing a plurality of mathematical formulae having variable parameters for the coordinate paths of said first and second axis, variable parameters relating to the rotation of each ring, whereby the angle of attack of said work tool relative to said third axis may be varied, manually operable input means including means for selecting one of said mathematical formulae and means for inducing in said selected formulae predetermined values for said variable parameters, and output means including a calculator responsive to said computer for providing a resultant output of given value for each said coordinate paths and means for converting said resultant output to electrical signals for operating the respective motor means for said carriage and bracket.

4,216,946
GATE ARRANGEMENT FOR COUNTERPRESSURE BLAST FURNACES

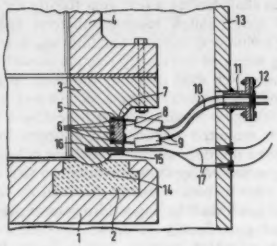
Wilhelm Sieweke, Dortmund; Hubert Nettler, Frönenberg, and Jürgen Burmann, Hagen, all of Fed. Rep. of Germany, assignors to Paul Wurth S.A., Luxembourg, Luxembourg

Filed Jul. 20, 1979, Ser. No. 59,279
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832476
Int. Cl.[3] F27B *11/12*
U.S. Cl. 266—87 6 Claims

1. Gate arrangement for counterpressure blast furnaces, comprising:

a seal lid having an annular soft seal-insert;

a gate having a steel seal-ring adapted to operatively contact at least said annular soft seal-insert of said lid at a seal surface; and

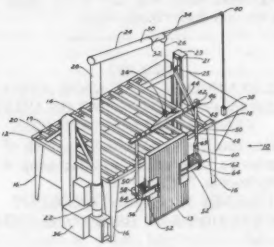


heating means operatively connectible to said steel seal-ring about the periphery thereof.

4,216,947
RADIATOR HOIST AND POSITIONER

Leon C. Chausse, Bellevue, Nebr., assignor to Inland Manufacturing Company, Omaha, Nebr.

Filed Jul. 7, 1978, Ser. No. 922,868
Int. Cl.[3] B23Q *1/04*
U.S. Cl. 269—71 8 Claims



1. An improved radiator hoist and positioner comprising:

an upright post;

a swing arm supported on the upright post for rotation about a first, substantially vertical axis;

an extensible and retractable hoist line mounted on the swing arm;

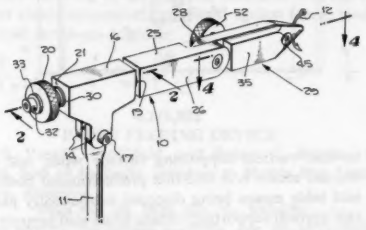
a yoke structure mounted on the hoist line for rotation about a second, substantially vertical axis;

at least two clamp mechanisms each including a pair of opposed pad members having generally planar radiator contacting surfaces defined thereon and further having an actuator mechanism (1) for advancing and retracting the pad members toward and away from each other so as to clamp and unclamp a radiator between the radiator contacting surfaces, and (2) for applying a force to the pad members so as to retain the pad members in the position in which the radiator is clamped, the clamp mechanisms mounted on the yoke structure for rotation about a common, substantially horizontal axis the clamp mechanisms each further including a base plate, and the actuator mechanism including a trunnion member, links connecting the pad members and the trunnion member, and means for drawing the trunnion member toward and away from the base plate, whereby the links are moved, respectively, toward and away from the base plate and the pad members are moved, respectively, toward and away from each other;

whereby a radiator is clamped, and raised or lowered by retracting or extending the hoist line, or rotated about the

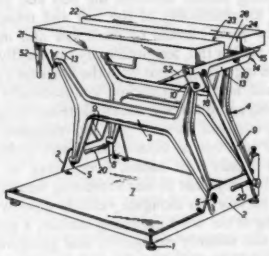
axes of rotation of the swing arm, yoke structure and clamp mechanisms, to a variety of desired positions.

4,216,948
FLY-TYING VISE
Efton T. Carter, 480 N. Peach St., Stayton, Oreg. 97383
Filed Jan. 8, 1979, Ser. No. 1,700
Int. Cl.[3] B25B *1/04*
U.S. Cl. 269—71 **1 Claim**



1. A fly-tying vise for securing a fish hook comprising:
(a) a supporting shaft;
(b) a base head pivotally coupled to said supporting shaft, said base head having a screw threaded aperture disposed therethrough perpendicular to the pivotal coupling between said base head and supporting shaft;
(c) a threaded bolt removeably and rotatably disposed within and engaged with the screw threaded aperture, said threaded bolt having first and second ends extended beyond the respective ends of said screw-threaded aperture;
(d) an intermediate housing being secured to the second end of said threaded bolt, said intermediate housing having a depending flange opposite said threaded bolt, said flange having an aperture disposed therethrough perpendicular to said threaded bolt;
(e) a helical spring disposed about the first end of said threaded bolt;
(f) a knob having a threaded aperture therethrough adapted to be disposed about and rotatably engaged with the first end of said threaded bolt, said knob being rotatably mounted upon the first end of said threaded bolt whereby said helical spring is resiliently compressed intermediate said knob and said base head;
(g) a vise assembly having first and second jaw members each having a complementary planar surface adapted to be adjacent one another, said first jaw member being pivotally coupled through the aperture in the depending flange of said intermediate housing;
(h) a resilient member disposed between the planar surfaces of said first and second jaw member whereby a forward opening is provided intermediate said planar surfaces for securing the fish hook therebetween;
(i) first and second threaded coupling means for adjusting the distance between a forward opening between the planar surfaces, said first and second threaded coupling means being adjustably coupled intermediate said first and second jaw members between said flange and said resilient member whereby the planar surfaces can be maintained in a parallel orientation when the fish hook is secured within the vise assembly; and
(j) a clamping apparatus comprising:
(1) first and second planar members each having top and bottom surfaces, the bottom surface of said first planar member and the top surface of said second planar member being adapted to be in parallel spaced relation to each other whereby a fixed medium is clamped between a portion thereof, said first planar member having first and second apertures therethrough, said second aperture having screw-threads impressed about the circumference thereof, said second planar member having a first aperture therethrough adapted to be aligned with the first aperture of the first planar member and having screw-threads impressed about the circumference thereof, and a depression disposed in the top surface of said second planar member adapted to be aligned with the second aperture through said first planar member, said first and second members including aligned openings therethrough intermediate the first and second apertures of said first planar member and the first aperture and the depression in said second planar member;
(2) locking means for securing the shaft within the openings through said first and second planar members; and
(3) screw-threaded bolts removeably and rotatably mounted between the first and second planar members.

4,216,949
WORKBENCHES
Ronald P. Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Channel Islands
Division of Ser. No. 846,575, Oct. 28, 1977, Pat. No. 4,140,309, which is a division of Ser. No. 642,743, Dec. 22, 1975, Pat. No. 4,076,229, which is a continuation of Ser. No. 495,265, Aug. 7, 1974, abandoned, which is a division of Ser. No. 177,123, Sep. 1, 1971, Pat. No. 3,814,619, which is a division of Ser. No. 803,600, Mar. 3, 1969, Pat. No. 3,615,087. This application Nov. 24, 1978, Ser. No. 963,195
Claims priority, application United Kingdom, Mar. 4, 1968, 10484/68
The portion of the term of this patent subsequent to Oct. 26, 1988, has been disclaimed.
Int. Cl.[3] B25B *1/10*
U.S. Cl. 269—139 **2 Claims**



1. A workbench comprising:
two laterally elongated rigid vise members having flat horizontal upper surfaces lying in substantially the same plane, said flat upper surfaces forming the complete uppermost work surface of the workbench free of structure projecting thereabove, said vise members having vertical clamping faces below said upper surfaces, said clamping faces being horizontally and vertically disposed in opposed relationship;
the width of said upper surface of each member in the horizontal direction perpendicular to its length being less than one quarter its length, and said width being greater than the depth of its clamping face by ratio of at least two to one;
supporting structure underlying and supporting said vise members;
means for connecting said vise members to said supporting structure for relative movement toward and away from each other, and for limited lateral movement;
means for limiting said lateral movement to less than the depth of said clamping faces;
two laterally spaced, independently operable, screw

threaded rods disposed beneath and closely adjacent said vise members, closer to the respective ends thereof than to the horizontal centerline thereof perpendicular to said clamping faces, said rods operatively interconnecting said vise members for moving the vise members together and apart; and

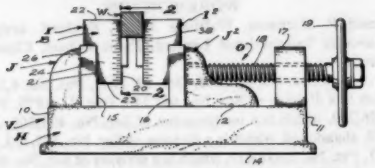
a handle connected to each of said rods at the front of the said workbench.

4,216,950

STEADY REST

W. Alfred Mason, P.O. Box 988, Big Bear Lake, Calif. 92315, and Kenneth L. Gerry, 232 N. Sherman Unit F., Corona, Calif. 91720

Filed Feb. 21, 1979, Ser. No. 13,023
Int. Cl.² B25B *1/24*
U.S. Cl. 269—271 **10 Claims**



1. A machine vise including an elongate, horizontal bed with opposite sides and ends, a first jaw projecting upwardly from one end portion of the bed and having a flat, vertical, laterally extending longitudinally inwardly disposed inner face, a second jaw projecting upwardly from the other end of the bed and having a flat, vertical, laterally extending longitudinally inwardly disposed inner face opposing the inner face of the first jaw, operating means between the bed and one jaw to move that jaw longitudinally of the bed and relative to the other jaw, a jaw plate carried by each jaw and including a block-like body with a flat, longitudinally outwardly disposed outer face in bearing engagement with the inner face of the jaw and a flat, vertical, laterally extending longitudinally inwardly disposed work-engaging surface, screw fastener means carried by the body and engaged with the jaw and releasably securing the body on the jaw, one or both of said jaws includes vertically adjustable steady rest means comprising an elongate work engaging bar adjacent to and extending laterally of said work engaging surface, an elongate verticle guideway in the body and opening at the work engaging surface, a guide block fixed to the bar and slidably engaged in said guideway and an elongate vertical jack screw carried by the body for free rotation and against axial movement and extending longitudinally through said guideway and threadedly engaged through said block.

4,216,951

BABY CHANGING APPARATUS

Barbara J. Griffin, 4288 Main St., Box 148, Brown City, Mich. 48416

Filed Dec. 11, 1978, Ser. No. 968,193
Int. Cl.² A61G *13/00*
U.S. Cl. 269—328 **8 Claims**

1. A baby-changing apparatus comprising:

spacer means adapted to be attached to a vertical supporting surface;

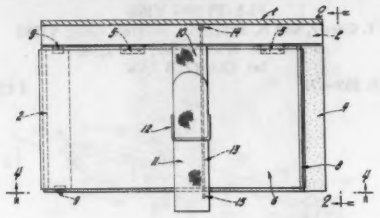
table means hingedly attached to said spacer means;

means for retaining a roll of paper disposed on a first side of said table means;

means for cutting and retaining a strip of paper disposed on a second side of said table means;

support bracket means disposed beneath said table means, said support bracket means being adapted to be hingedly attached to said vertical supporting surface, and being provided with means for engaging an outermost edge of said table means to prevent unintentional movement of said support bracket means when said bracket means is disposed in a first predetermined position;

said table means being disposed substantially perpendicular



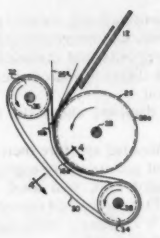
to said vertical supporting surface when said support bracket means is in said first predetermined position, and said table means being disposed substantially parallel to said vertical supporting surface when said support bracket means is in a second predetermined position.

4,216,952

FEED MECHANISM FOR SEQUENTIALLY SEPARATING DOCUMENTS, SHEETS, COUPONS AND THE LIKE

George P. McInerny, Andalusia, Pa., assignor to Technitrol, Inc., Philadelphia, Pa.

Filed Jan. 16, 1978, Ser. No. 869,663
Int. Cl.² B65H *3/52*
U.S. Cl. 271—10 **28 Claims**



1. A document separation system for separating sheets from a stack one at a time in a sequence determined by the order of the documents in the stack comprising:

a support frame,

a resilient continuous stretchable friction belt, providing a first friction member and constituting a self-adjusting member permitting accommodation of documents of different thickness and different surface friction characteristics,

separate rotatable support and path defining means on the frame for supporting said continuous stretchable friction belt,

two coaxial generally cylindrical friction drums of like diameter rotatably supported on the support frame, each having a friction surface extending around the drum and together providing a second friction member,

a non-friction drum of approximately the diameter of the friction drum but of smaller diameter and coaxial with and between the two friction drums over the surface of which the continuous stretchable friction belt is stretched from a straight path between support means into a taut conforming path over the non-friction drum surface to thereby supply forces acting normal to a sheet passing between the

stretchable belt and the drums to generate frictional forces parallel to the sheet, and

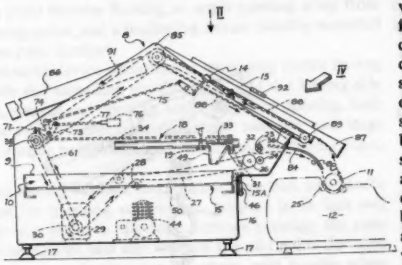
drive means on the support frame for driving the continuous stretchable belt in one direction and the two friction drums together in the opposite direction, such that the first and second friction members are moving in opposite directions over a sheet passing between them and when more than one sheet enter the space between the friction members only that sheet against the friction member moving forward will pass through the system and the friction member moving in the opposite direction will drive all other sheets successively rearward against forces tending to hold the sheets together.

4,216,953

PAPER FEEDING DEVICE

Joseph S. Varady, Smithfield, and Robert C. Knights, Balgowlah, both of Australia, assignors to Hafotu Pty. Limited, Sydney, Australia

Filed Apr. 18, 1978, Ser. No. 897,470
Claims priority, application Australia, Apr. 20, 1977, PC9814
Int. Cl.³ B65H *3/08, 1/24*
U.S. Cl. 271—11 **6 Claims**



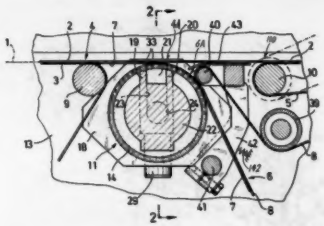
1. A device for supply of stationery to a machine such as an electric typewriter which machine incorporates means for advancement of stationery therethrough, said device comprising a housing frame having a front end portion through which stationery is advanced, a driving rotatable roller means within said housing frame for frictionally advancing in repeated cycles the leading edge of successive items of said stationery to and beyond said front end portion for a predetermined distance, means for rotating said roller means for a part of each operating cycle of said device while said roller means is frictionally engaged with a respective item of said stationery and by the same amount in each of said cycles whereby each successive item of said stationery is advanced the same distance by said roller means, means to bring about frictional disengagement of said roller means from said stationery item during another part of each of said cycles, and unidirectional friction means for grasping said stationery item to restrain return of said item, whereby further advancement of said stationery item by said advancement means of said machine is substantially unimpeded, and further comprising an open topped storage tray within said housing for a stack of stationery items, a paper feed frame above said tray mounted for reciprocation between a first position, whereat the stationery item uppermost in said stack is removed from said stack by said frame, and a second, forward position whereat said removed item is inserted through said roller means, a mechanism resiliently supporting the floor of said storage tray, and control means for said mechanism to effect lowering of said floor immediately prior to removal of said uppermost item to release compression on said stack and thereby to facilitate said removal.

4,216,954

APPARATUS FOR DIVERTING PAPER SHEETS OR THE LIKE FROM A FIRST PATH INTO A SECOND PATH

Hans-Dieter Kwasnitza, Neuffen, Fed. Rep. of Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed May 26, 1978, Ser. No. 910,090
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1977, 2725546
Int. Cl.² B65H *29/60*
U.S. Cl. 271—283 **14 Claims**



1. Apparatus for moving discrete paper sheets or analogous commodities, comprising transporting means including conveyor means for advancing successive commodities along a first path; means defining a second path having an inlet adjacent a predetermined portion of said first path; means for diverting selected commodities from said first path into said second path, including a hollow cylindrical foraminous barrel extending transversely of said paths adjacent said portion of said first path and said inlet of said second path, said barrel being arranged to rotate in the direction of advancement of sheets along said first path and at a peripheral speed at least approximately the speed of said conveyor means, suction generating means, and means for connecting the interior of said barrel with said suction generating means not later that when a selected commodity enters said portion of said first path whereby said barrel attracts such selected commodity and diverts the selected commodity into the inlet of said second path; a member defining a chamber, said member being disposed in the interior of and being rotatable with respect to said barrel, said chamber having an open side which is at least partly open and is adjacent the internal surface of said barrel, said member occupying a portion of the interior of said barrel and including partitioning means for sealing said chamber from the unoccupied portion of the interior of said barrel, said connecting means comprising a valve having ports communicating with said chamber and said suction generating means, and means for actuating said valve to connect said chamber with said suction generating means not later than when a selected commodity enters said portion of said first path; and means for rotating said member at the rate of one revolution for each commodity which advances along said portion of said first path.

4,216,955

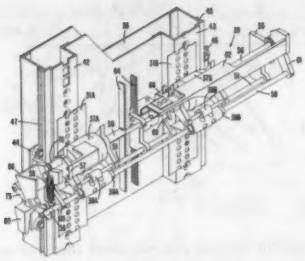
JAM CLEARANCE MECHANISM FOR A TRAVELING DISTRIBUTOR IN A COLLATING SYSTEM

Michael D. Avritt; Richard A. Lamos, both of Boulder, and Alfonso A. Rosati, Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,650
Int. Cl.² B65H *29/60*
U.S. Cl. 271—296 **6 Claims**

1. In an apparatus for distributing sheets or the like into a plurality of receptacles which have openings along a common plane wherein said apparatus includes a sheet conveyor having at least one flexible belt arranged in a continuous loop, a traveling distributor on a carriage which is movable incrementally in parallel relation to the common plane of the receptacle openings with the carriage including a first roller assembly for

diverting the belt from a plane spaced from but parallel to the receptacle opening common plane into a direction towards the common plane and a second roller assembly arranged for further diverting the belt at least into a plane parallel to the common plane whereby sheets conveyed by the belt are directed into the receptacles through the openings thereof by means of the inherent stiffness and momentum of the sheets as the belt is diverted by the second roller assembly, said apparatus further including means for continuously moving the belt and means for selectively moving the carriage, an improvement comprising mounting means on the distributor carriage securing one of said roller assemblies in its sheet distributing position for applying tension to the belt, said mounting means including means selectively operable for moving said one of said roller assemblies in a direction for relieving the tension of the belt thereby permitting removal of sheets from between the belt and said first roller assembly, whereby the removal of sheets from the belt for jam recovery purposes is facilitated by operation of said selectively operable belt tension relieving means.

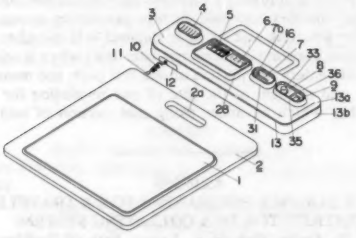


4,216,956

RUNNING MACHINE

Yukio Yamamura; Tsutomu Ichinomiya, and Shinichi Ishimaru, all of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 7, 1978, Ser. No. 884,224
Claims priority, application Japan, Mar. 7, 1977, 52-25118
Int. Cl.[2] A63B *23/04*
U.S. Cl. 272—70 **4 Claims**



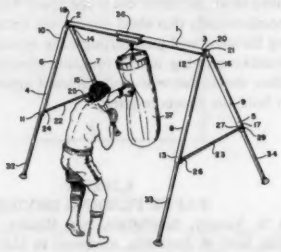
1. A running machine comprising a mat means having mat switch means for producing a first output signal when the mat means is depressed, a running circuit means coupled to said mat switch means for processing the output signal from the mat switch means and producing an output signal when the OFF time of the output signal from the switch means is longer than a predetermined time, manually controlled flying duration circuit means in said running circuit means for variably setting said predetermined time, and an indicating means for receiving the output of said running circuit means and for indicating the number of steps taken by a user.

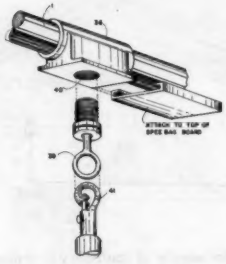
4,216,957

STRIKING BAG EXERCISE STRUCTURE

Edward R. Curatola, 295 Jewett Ave., Staten Island, N.Y. 10302

Filed Jul. 14, 1978, Ser. No. 924,737
Int. Cl.[3] A63B *69/00*
U.S. Cl. 272—78 **2 Claims**



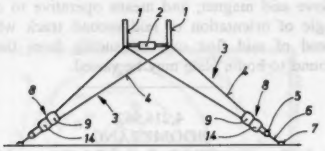


1. An exercise structure, comprising
a cross bar having spaced opposite first and second ends;
first and second support structures removably mounted on the cross bar at the first and second ends thereof, respectively, each of the first and second support structures having first and second pipes each having spaced opposite first and second ends with a closed loop at the first end mounted coaxially around the cross bar, the second end of each of the first and second pipes being open, and a strut having spaced opposite first and second ends and pivotally affixed at its first end to the first pipe at the second end of said first pipe and releasably coupled at its second end to the second pipe at the second end of said second pipe;
four legs each coaxially removably adjustably mounted in a corresponding one of the first and second pipes of the first and second support structures at the open second end thereof; and
mounting means on the cross bar at substantially the center of said cross bar for mounting one of a heavy punching bag and a speed punching bag, said mounting means having a base plate mounted on said cross bar, said base plate having an internally threaded bore formed therein, and an eye member having a first end with a ring extending therefrom and a spaced opposite externally threaded second end threadedly coupled in the bore of said base plate, a speed punching bag being releasably coupleable to the ring of said eye member.

4,216,958
TENSIONING DEVICE FOR A GYMNASTICS APPARATUS

Richard Reuther, Philipp-Stempel-Str. 3, Ludwigshafen am Rhein, Fed. Rep. of Germany (6700)

Filed Mar. 2, 1977, Ser. No. 773,697
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1976, 2609898
Int. Cl.[2] A63B *5/00, 7/00*
U.S. Cl. 272—109 **2 Claims**



1. A gymnastics apparatus including two supports to be braced, an anchoring point on the floor, two rope sections, one end of each rope section being fixed to one of the supports, the other end of each rope section being unadjustably fixed to the anchoring point thereby forming an angle opening away from the anchoring point, and a tensioning device slidably mounted on the two rope sections;

the tensioning device comprises: a tensioning sleeve having a guide slot extending therethrough, said slot having side walls, a small end opening, and a large end opening, both of the rope sections running through said slot, said large end opening being oriented towards said anchoring point; and

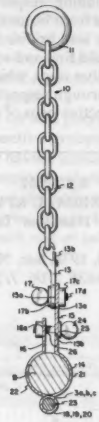
a wedge having edges, a small end, a large end, and handle means for handling said wedge, adapted to fit into said guide slot between the rope sections pressing the rope sections against said side walls of the said guide slot, said handle means having handle edges, said handle edges being provided with guide grooves with groove walls in which said rope sections are guided, said groove walls extending outwardly beyond said rope sections.

4,216,959
WEIGHT LIFTER SAFETY CHAIN

Arthur B. Niles, P.O. Box 6515, 1409 T St. Station, Washington, D.C. 20009

Filed May 1, 1978, Ser. No. 900,774
Int. Cl.[3] A63B *13/00*
U.S. Cl. 272—123 **1 Claim**

1. The combination of a manually adjustable safety chain and a barbell support for supporting a barbell comprising: a chain means for supporting a barbell; said chain means comprising two separate chains, each chain having mounted at one end an annular metallic ring; said ring being attached to be hung from a barbell rest cradle; said chain means further including a round fast eye bolt snap hook means connecting said chain means to a barbell; said snap hook means including a circular hinge clamp having two flat ends and two semi-circular shaped portions, said clamp being peripherally joined in a retractable hinged relation at a point adjacent said two semicircular portions; said snap hook means including means connecting together both said retractable hingedly mounted ends of said flat plate of said hinge clamp so as to fasten said clamp around a bar

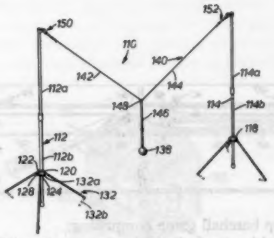


of a barbell; and means connecting said snap hook means to said hinge clamp.

4,216,960
TETHERED BALL TENNIS PRACTICE APPARATUS

Oswald C. J. Nicholls, 294 Warrigal Rd., Burwood, Victoria, Australia

Filed Mar. 7, 1978, Ser. No. 884,174
Claims priority, application Australia, Mar. 8, 1977, PC9331; Aug. 8, 1977, PD1131
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **16 Claims**



1. A ball game practice device comprising a ball, a line having first, second and third sections extending from a common junction to respective outer ends thereof, at least said first and second sections being formed of elastic material, two elongate members positionable to extend from a ground surface in upright spaced disposition, first and second connection means for connecting outer end portions of the first and second sections to respective elongate members, and an outer end portion of the third section being connected to said ball whereby, in use of the device with the elongate members positioned in said upright spaced disposition and the outer end portions of said first and said second sections connected to the respective elongate members by said connection means, the ball is then suspended from the junction of said first and said second sections through said third section; outer end portions of the material forming said first and second line sections being formed into respective loops, said first and second connection means each comprising a separate plastics body, said plastics bodies having respective cylindrical surfaces of substantially

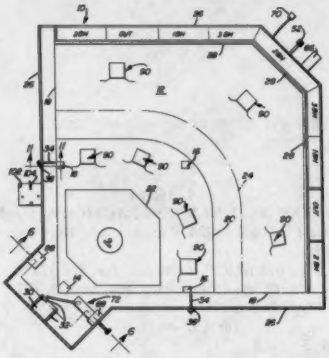
less circumferential dimension than the unstretched lengths of the material forming the said loops and the said loops being engaged around respective ones of said cylindrical surfaces, said bodies further including respective retaining portions preventing the said loops from becoming disengaged from the said cylindrical surfaces; said bodies having respective apertures therethrough and said first and second connection means further including respective rings which pass through respective said apertures and through respective openings in connection portions of the respective ones of said two elongate members.

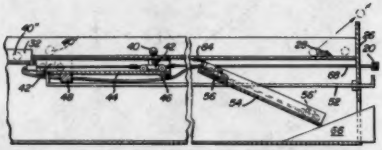
4,216,961

TABLE BASEBALL APPARATUS

Mary J. McQuillan, 44 Hamilton Ter., Georgetown, Mass. 01830

Filed Aug. 4, 1978, Ser. No. 931,128
Int. Cl.³ A63F *7/06, 7/26, 7/28*
U.S. Cl. 273—89 **4 Claims**





4. A tabletop baseball game comprising:

a game board having indications thereon describing a baseball diamond having a home plate, a first base, a second base, and a third base;

a pitching means for pitching a ball across home plate;

foul ball markers removably mounted to said game board for indicating foul balls;

a depression located behind game plate with walls extending above said depression wherein any pitched ball which enters said depression is considered a strike;

batting means operative to hit a pitched ball;

bumper means extending about the outfield operative to propel a moving batted ball off the game board to indicate a home run;

fielding mechanisms comprising upstanding vertical walls defining an interior space, a hinged door connected to said upstanding walls and operative to allow a moving ball to enter the interior space, said hinged door also operative to be moved by a player against the ball to impart motion to said ball in order to simulate throwing of said ball;

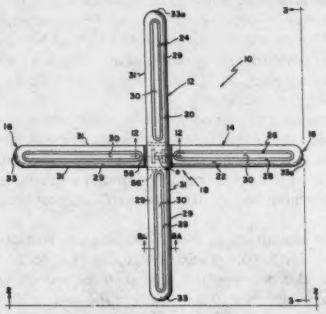
said pitching means comprising a first track disposed below said game board and pivotally mounted at one end beneath the pitcher's mound with the free end thereof capable of movement beneath home plate; a first cart positioned in said track for linear movement along said track; a magnet positioned in said first cart; a second track disposed below said game board and capable of variable vertical angular orientation, a second cart disposed for linear motion within said second track; means connecting said second cart to said first cart whereby motion of said second cart down said vertically oriented second track will impart motion of said first cart along said first track from the pitcher's mound in the direction of home plate; a magnetizable ball for positioning on said game board above said magnet; and means operative to change the angle of orientation of said second track whereby the speed of said first cart advancing from the pitcher's mound to home plate may be varied.

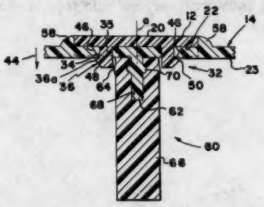
4,216,962

BOOMERANG

Stephen J. Flemming, 3312 S. Center Rd., Burton, Mich. 48519

Filed Jan. 12, 1978, Ser. No. 868,992
Int. Cl.² A63B *65/08*
U.S. Cl. 273—426 **17 Claims**





17. A boomerang comprising:

first and second elongate, longitudinally curvilinear, symmetrical airfoils each including opposed terminal ends, an intermediate midportion, a generally smooth, uninterrupted, longitudinally curvilinear lower surface, and a convex upper surface joined to said lower surface at lateral edges; and

means for detachably coupling the midportions of said airfoils together for concurrent rotation, when propelled, about an axis transverse to said airfoils;

said airfoils having such aerodynamic characteristics that said airfoils, when bodily propelled through the air from a starting location and concurrently rotated about said axis, will follow a curvilinear path and generally return to said starting point;

said upper convex surfaces each including elongate, longitudinally extending concave recesses therein laterally between said lateral edges; said recesses commencing adja-

cent said midportions and terminating adjacent said terminal ends.

4,216,963

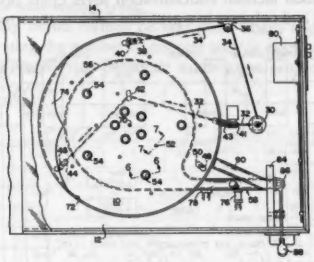
PLAYER CONTROLLED TILTING GAME HAVING AN ELECTRONIC DISPLAY AND CONTROL SYSTEM

Joseph N. Boucher, 6826 Nowadaha Blvd., Orlando, Fla. 32808

Filed Jun. 14, 1979, Ser. No. 915,523

Int. Cl.[2] A63F 7/16

U.S. Cl. 273—110 **9 Claims**



1. Game apparatus comprising:
(a) a cabinet;
(b) a tiltable table supported by said cabinet;
(c) at least one ball on said table surface and freely movable by gravity;
(d) a first target on said table surface;
(e) a plurality of second targets on said table surface surrounding said first target;
(f) plural ball entrapments encircling said first target;
(g) means for illuminating all of said targets; and
(h) circuit means coupled with said illuminating means for altering the illumination of said first target only after contact with all of said second targets by said ball.

4,216,964

PUZZLE GAME

Ernest A. Gans, 84-39 153rd Ave., Howard Beach, N.Y. 11414

Continuation-in-part of Ser. No. 752,407, Dec. 20, 1976, Pat. No. 4,138,115. This application Jan. 26, 1979, Ser. No. 6,547

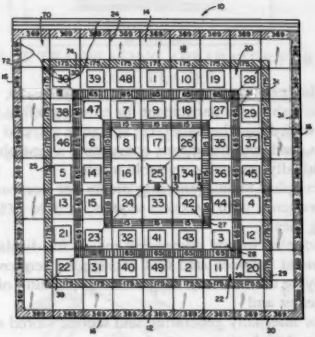
Int. Cl.[3] A63F 9/06

U.S. Cl. 273—153 R **20 Claims**

1. A number problem game, which comprises:
A. a playing board having a planar surface thereon,
B. an odd number of squares arranged in an equal number of horizontal and vertical rows intersecting each other on said playing board,
C. a plurality of multi-sided playing elements with each element having different sequentially numbered indicia thereon, said elements being arrangeable on said squares of said board to satisfy a predetermined value which is satisfied by the arithmetical equation:

$$X = \frac{\sqrt{n}\,(a + N)}{2}$$

wherein:
a=first numbered indicia of a series
N=last numbered indicia of a series
n=total number of elements in a series
$\sqrt{n}$=being an integer, and the interval in the series is a constant
such that when said plurality of elements are properly positioned on said squares, the sum of the numbered indicia on said elements on each of said horizontal and vertical rows is equal to X,
D. a coding provided on a plurality of the respective sides of said multi-sided playing elements in conjunction with said numbered indicia such that said elements may be divided into respective sets, wherein each one of said sets being of a select number of said elements for use in the solution of one problem of the game,
E. at least one border on said playing board in surrounding relationship to respective groups of odd numbers of said squares, said border having indicium thereon equivalent to one of said predetermined values of X
F. retaining means for releasably securing each one of said individual elements in interlocking relationship to said playing board on each one of said squares,

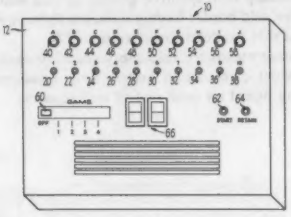


G. solution means adapted to be operatively positioned on said playing board for each of said respective groups, such that a player may quickly determine if the proper solution to the number game has been obtained,
H. said solution means including a sheet having positioned thereon the correct numerals for the group of the game selected, said numerals each extending in overlapping relationship to a respective one of said squares,
I. coupling means for removably securing said sheet to said playing board along substantially one end thereof, and
J. said coupling means includes:
(1) an elongated groove extending along one edge of said playing board, and
(2) a protrusion extending outwardly from one end of said sheet and adapted to be releasably positioned in frictional engagement with said groove.

4,216,965
MICROCOMPUTER CONTROLLED ELECTRONIC GAME APPARATUS

Howard J. Morrison, Deerfield, Ill.; Ralph H. Baer, Manchester, N.H., and Jeffrey D. Breslow, Highland Park, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 30, 1977, Ser. No. 865,898
Int. Cl.[3] A63B *71/04*
U.S. Cl. 273—237 **20 Claims**



1. An electronic game device comprising:

means actuable by a participant for entering a first sequence represented by the order of actuation of said entering means, said entering means comprising a first plurality of individually manually operable means;

means coupled to said entering means for comparing said first sequence with a second sequence stored in said comparing means;

means coupled to said comparing means for displaying the agreement between said first and second sequences, said displaying means comprising a second plurality of indicating means; and

means for internally generating said second stored sequence on a random basis,

said second sequence representing a correspondence relationship associating said first plurality of manually operable means and said second plurality of indicating means,

said comparing means comprising means for controlling said display means to actuate said indicating means corresponding to said associated manually operable means upon actuation of said particular manually operable means,

said comparing means further comprising means for storing the agreement between said first and second sequences and controlling said display means to continuously energize the indicating means corresponding to the number of sequence positions in agreement and penalty means for modifying said stored agreement in said storing means in response to actuation of a manually operable means corresponding to an indicating means and representing a position in said second sequence already stored in said storing means.

4,216,966
BOARD GAME SIMULATING DRUNK DRIVING

Thomas H. MacRae, 4948 Bryant Ave. S., Minneapolis, Minn. 55409

Filed Jul. 19, 1978, Ser. No. 926,096
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—243 **6 Claims**

1. A gameboard apparatus for a game simulating possible experiences of a player consuming liquor in relation to a time span comprising in combination:

(a) a gameboard having a series of playing locations thereon and forming a path about the board,

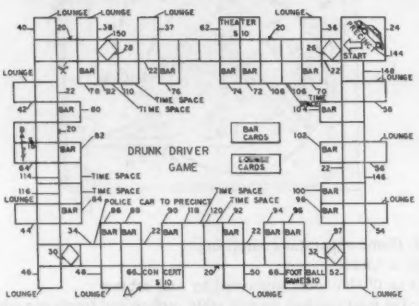
(b) player stop locations adjacent some of said path locations, said stop locations comprising two types, each type identified by indicia distinct from the indicia on the other type;

(c) player tokens for moving on said playing locations and said stop locations;

(d) first chance means for controlling the movement of said player tokens;

(e) two decks of cards, the cards in the first deck having indicia on the reverse thereof corresponding to the indicia on said first type of stop location, the cards in the second deck having indicia on the reverse thereof corresponding to the indicia on said second type of stop location, the obverse of each of said cards in both decks having two distinct types of indicia thereon the first type of indicia indicating the amount of liquor consumed, the second type of indicia indicating the time elapsed in consuming the liquor;

(f) a blood alcohol concentration level chart divided into rows and columns in a grid-like fashion, the rows thereon



identified by indicia corresponding to said first type of obverse indicia, the columns thereon identified by indicia corresponding to said second type of obverse indicia, and wherein the intersections of each of said columns with each of said rows has indicia therein yielding a blood alcohol concentration level;

(g) a third deck of cards, the reverse of each card in the third deck having indicia thereon corresponding to the indicia on said indicia-bearing playing locations, the obverse of each card in the third deck having indicia thereon corresponding to said blood alcohol concentration level indicia;

(h) a playing token simulating a police car

(i) a second chance means for determining the movement of said police car token.

4,216,967
PRESIDENT ELECTION GAME

Salvador Marse, 320 South Harrison St., East Orange, N.J. 07018

Continuation-in-part of Ser. No. 756,775, Jan. 5, 1977, Pat. No. 4,092,028, and Ser. No. 789,098, Apr. 20, 1977, Pat. No. 4,118,036. This application May 25, 1978, Ser. No. 909,518
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—257 **25 Claims**

6. A presidential election game for one of the players to win and thus become "President", said game comprises in combination:

A. a game board having a playing surface,

B. a series of outer zones extending along each side of the periphery of said game board,

C. a first series of inner zones extending across said playing board and contiguous to said outer zones along spaced apart sides of said game board,

D. a second series of inner zones extending across said playing board in spaced apart relation to said first series of inner zones and contiguous to said outer zones along spaced apart sides of said game board,

E. said outer and inner zones comprising at least fifty-one voting areas comprised of the fifty States and the District of Columbia,

F. numerical indicium contained on each one of said zones

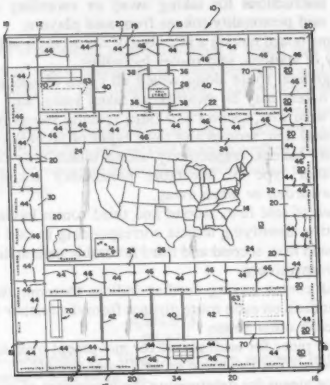
constituting a voting area, said numerical indicium being designative of the number of popular and/or electoral college votes allocated to each of said voting areas,

G. first chance means operable by players of the game apparatus so as to produce a random number for determining the percentage of votes accumulated by each player in each of said voting areas,

H. second chance means operable by players of the game apparatus so as to produce a random number for determining the number of zones the player may advance,

I. tabulation means formed on said game board for tallying the number of votes each player has accumulated on each one of said voting areas,

J. posting means formed on said game board and used for indicating the number of popular and/or electoral college votes posted by each player as the game progresses,



K. a marker for each player that differs in color or configuration, said marker placed initially on one said zone by each said player and progressively moving from zone to zone by utilization of said second chance means and accumulating votes by said first chance means in order to win the election and become "President",

L. indicating means on each one of said voting areas to obtain the number of votes the player has obtained on the player's usage of said first chance means, and

M. said indicating means being in the form of a voting box having a plurality of parallel spaced apart columns with identification of each player and a plurality of spaced apart apertures, and as a result the player is given a total vote count obtained on each usage of said first chance means in a particular one of said voting areas.

4,216,968

SELF-SCORING MULTIPLE FUNCTION DART GAME

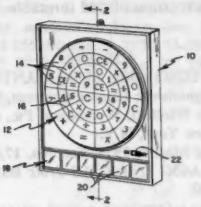
David Yeeda, 6531 Dykes Way, Dallas, Tex. 75230

Filed Oct. 11, 1978, Ser. No. 950,467

Int. Cl.³ F41J *5/04*

U.S. Cl. 273—376 **9 Claims**

1. A self scoring dart game comprising a target panel having an array of individual target areas each identified by an individual symbol, each of said areas having at least two independent signal producing means associated therewith, the signal producing means associated with each of said target areas being adapted to produce substantially identical electronic signals upon being impacted by a dart, logic means responsive to said signals for performing one of a plurality of different mathematical functions upon receiving at least two electronic signals,



and display means for indicating the result of a mathematical function performed by said logic means.

4,216,969

CARRIAGE TRANSLATING APPARATUS FOR VIDEO DISC PLAYER

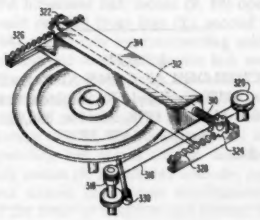
James A. Allen, Monrovia, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,536

Claims priority, application United Kingdom, Feb. 13, 1978, 05735/78

Int. Cl.³ G11B *17/04, 17/26*

U.S. Cl. 274—9 B **3 Claims**



1. A player for use with a disc record removably subject to occupancy of a protective caddy; said player comprising:

(A) a housing having an input slot into which a caddy is inserted;

(B) means for guiding caddy insertion into said housing along a path;

(C) a turntable for centering and rotatably supporting a record;

(D) means for removing a record from a caddy during caddy withdrawal subsequent to arrival of a record-carrying caddy at a fully inserted position in said housing, whereby a record is retained in said housing upon conclusion of such caddy withdrawal;

(E) a platform mounted in said housing subject to motion between an elevated position and a depressed position (1) for supporting a retained record while occupying said elevated position, and (2) for effecting transfer of said retained record to said turntable during its motion toward said depressed position;

(F) a signal pickup for recovering prerecorded information from a turntable-supported record during playback;

(G) a carriage for supporting said signal pickup;

(H) means for guiding said carriage in said housing along a second path parallel to said path of caddy insertion; said carriage guiding means including a pair of spaced, toothed rails fixedly mounted on said platform, and extending parallel to said paths; a gear shaft being rotatably secured to said carriage; a pair of spaced toothed wheels being mounted on said gear shaft adjacent to the respective ends

of said carriage for engagement with the respective one of said toothed rails; and

(I) means for translating said carriage during playback along said second path away from a starting position in correlation with the rotation of said turntable.

4,216,970

VIDEO DISC LUBRICANTS

Chih C. Wang, Hightstown; Lincoln Ekstrom, Princeton, both of N.J., and Henry Wielicki, Wyndmoor, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 5, 1979, Ser. No. 17,099

Int. Cl.[2] A63G *1/34*; G11B *5/00*; B32B *3/02*

U.S. Cl. 274—42 R **8 Claims**

1. In a video disc information record, adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a siloxane lubricant coating from about 150 to 500 angstroms thick, the improvement which comprises utilizing as said lubricant a liquid composition of the formula

$$R_3(CH_3)_2Si\text{—}[O\ Si(CH_3)_2]_m\text{—}O\ Si(CH_3)_2R_3'$$

wherein R_3 and R_3' independently at each occurrence are long chain alkyl groups of 10–14 carbon atoms and m is an integer of 0 or 1.

4,216,971

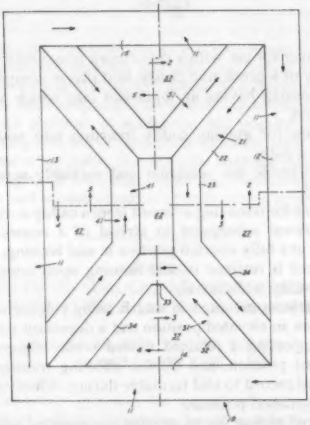
PSYCHOLOGICAL GAME APPARATUS

Hiram J. Lyke, 14180 Crabapple Rd., Golden, Colo. 80401

Filed Mar. 20, 1978, Ser. No. 888,021

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—243 **28 Claims**



1. A game apparatus for play among players to simulate different human experiences and their psychological effects, comprising:

a plurality of tokens each representative of personality enrichment, including:

a first type of favorable personality token representing pleasurable experiences with each said first type of token having distinctive identifying indicia,

a second type of favorable personality token representing rewards for using one's intellect with each said second type of token having distinctive identifying indicia;

a third type of favorable personality token representing rewards for pride in achievement with each said third type of token having distinctive identifying indicia, and

unfavorable personality tokens representing guilt feelings with distinctive identifying indicia;

a plurality of decks of chance cards including:

a first deck with each card in said first deck having distinctive identifying indicia corresponding to said indicia on said first type of favorable personality token,

a second deck with each card in said second deck having distinctive identifying indicia corresponding to said indicia on said second type of favorable personality token, and

a third deck with each card in said third deck having distinctive identifying indicia thereon,

each of said chance cards having printed matter with instructions for taking away or awarding designated said personality tokens from said players;

a game board having a plurality of routes each with a plurality of stations, said routes including:

a general route along which all types of said personality tokens may be awarded or taken away, and

at least first, second and third specific routes for each of said first, second and third types of favorable personality tokens, respectively, along which only one associated type of favorable personality token may be awarded or taken away,

each of said first, second and third routes having distinctive identifying indicia corresponding to said indicia on said first, second and third favorable personality tokens, respectively;

said routes having further indicia thereon, the further indicia on each route distinct from the further indicia on each other route;

a game piece for each player for movement over said routes from station to station on said game board;

chance means for determining the movement of each of said game pieces;

said stations having printed matter with instructions for awarding or taking away designated of said personality tokens from a player and representative of different human experiences; and

a plurality of elements, a set of which is representative of an enriched personality, the acquisition of a set of which determines the winner of the game, at least some of said elements each having distinctive identifying indicia corresponding to said further indicia on one of said first, second, and third routes, said elements being available to a player when the player has a preselected amount of said personality tokens and lands on selected of said stations having printed matter with instructions for the acquisition of said elements.

4,216,972

UNITIZED FACE TYPE SEAL

E. A. Domes, Carpentersville; Forrest C. Taylor, Northlake, and Lawrence A. Venere, Wood Dale, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Division of Ser. No. 931,587, Aug. 7, 1978. This application Jun. 4, 1979, Ser. No. 45,495

Int. Cl.[3] F16J *15/34*

U.S. Cl. 277—39 **4 Claims**

1. A unitized face type seal comprising:

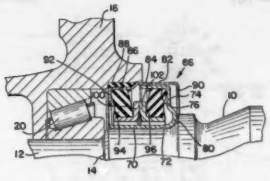
a first and a second annular face type seal ring having axially and radially extending surfaces and flat engagement surfaces machined on said radially extending surfaces;

a first and a second annular resilient ring in contact with the non engaging surfaces of said respective first and said second annular face type seal ring;

an interior shell having a base portion, a radially extending wall, a projection in said radially extending wall at the

juncture of said base portion in said radially extending wall and a transverse axially disposed upper portion for maintaining said second annular resilient ring in position;

an exterior shell having a circumferential band portion and a first and a second radially projecting flange member, said second radially projecting flange member extending toward said base of said interior shell parallel to said radially extending wall of said interior shell;



a seal of elastomeric material having a width less than the width of said circumferential band portion of said exterior shell whereby said interior shell, said exterior shell and said seal of elastomeric material provide a unitized housing for supporting said first and second face type seal rings through said first and second annular resilient rings in face to face contact and properly aligned relative to each other at all times.

4,216,973

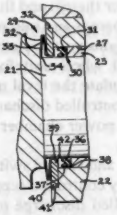
SEAL

Orville E. Kessinger, Jr., Blue Grass, Iowa, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 8, 1979, Ser. No. 10,338

Int. Cl.[2] B62D *55/00*; F16J *15/34*

U.S. Cl. 277—92 **16 Claims**



1. In a structure (10) having a shaft (21) extending axially outwardly into an opening (27) in a mounting member (22) for rotation about the longitudinal axis of the shaft therein, an improved sealing means (29) for rotatively sealing the shaft to the mounting member comprising:

an annular lip seal (30) in said opening, said lip seal extending concentrically sealingly about the shaft (21) and sealingly engaging the mounting member (22);

an annular labyrinth seal (32) in said opening axially inwardly adjacent said lip seal (30) and extending concentrically about the shaft (21) and spaced radially inwardly closely adjacent the mounting member (22) to define a sealing labyrinth therebetween; and

an annular dirt seal (33) axially outwardly adjacent said labyrinth seal (32) and extending concentrically to said shaft (21) and movably sealed to said labyrinth seal (32) and shaft.

4,216,974

COLLAPSIBLE BABY CARRIAGE

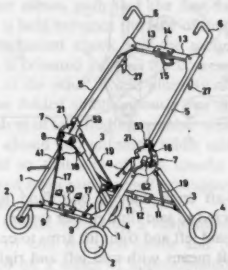
Kenzo Kassai, Higashishimizu, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed May 1, 1978, Ser. No. 901,341

Claims priority, application Japan, Jun. 15, 1977, 52-71460; Dec. 22, 1977, 52-155189; Jan. 7, 1978, 53-596[U]; Jan. 27, 1978, 53-8442; Jan. 27, 1978, 53-8443; Jan. 27, 1978, 53-9151[U]

Int. Cl.[2] B62B *7/08*

U.S. Cl. 280—42 **10 Claims**



1. A collapsible baby carriage comprising a pair of parallel front legs (1) with respective wheels, a pair of parallel rear legs (3) with respective wheels, and a pair of parallel push rods (5) with respective handles, two pivot means (7), each pivot means operatively connecting one front leg, one rear leg, and one push rod, first hingeable link means (9, 10) operatively interconnecting said parallel front legs (1), second hingeable link means (13, 14) operatively interconnecting said parallel push rods (5), said first and second hingeable link means (9, 10; 13, 14) being hingeable substantially upwardly, first operating means (16) extending substantially in parallel to at least one of said push rods and to at least the respective one of the front legs, lever means (57, 58, 59, 60) operatively interconnecting said first operating rod means (16) to said first and second hingeable link means (9, 10, 13, 14) whereby operating one of said first and second link means simultaneously causes the operation of the other of said first and second link means, and second operating means (17) operatively interconnecting said first hingeable link means (9, 10) and said parallel rear legs (3) whereby operating of said first hingeable link means is operatively associated with the closing and opening of an angle of intersection between said rear legs (3) and said front legs (1).

4,216,975

TRACTOR HITCH

Richard A. Schafer, Traer, Iowa, assignor to Deere & Company, Moline, Ill.

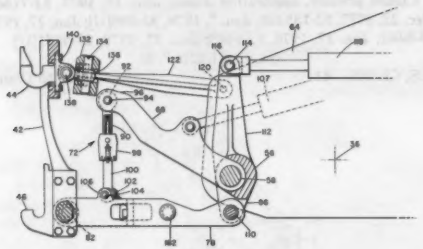
Filed Dec. 11, 1978, Ser. No. 968,359

Int. Cl.[2] B60D *1/16*

U.S. Cl. 280—461 A **57 Claims**

1. A hitch for a vehicle having a fore-and-aft extending body having left and right sides carried by fore-and-aft pairs of ground-engaging wheels respectively mounted on left and right extending fore-and-aft axles and carrying a fluid power system, comprising: frame means integral with the left and right sides of said vehicle body; left and right fore-and-aft extending draft links having respective fore ends pivotable proximate said frame means and having respective aft ends respectively distal from the respective fore ends thereof; left and right extending rockshaft means disposed proximate the fore ends of said left and right draft links pivotally secured to said frame means below a horizontal plane passing through said aft axle, said rockshaft serving as a load carrying means for said left and right draft links, left and right fore-and-aft extending lift arms having respective fore ends fixed to said rockshaft means proximate said frame means and having aft ends respectively distal from the respective fore ends thereof; left and

right vertically extending lifting means having respective upper ends respectively connected to the aft ends of said left and right lift arms and having respective lower ends respectively connected to said left and right draft links between the



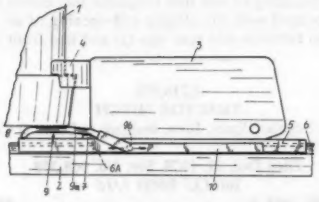
respective fore-and-aft ends thereof; and fluid lift actuator means fluidly connected to said fluid power system and operatively connected to said left and right lift arms to cause pivotation of said rockshaft means with said left and right lift arms pivoting to cause pivotation of said left and right draft links.

4,216,976

HEEL-RELEASE BINDING WITH A COUPLED SKI BRAKE

Erwin Krob, Vienna, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jun. 2, 1978, Ser. No. 911,799
Claims priority, application Austria, Jun. 16, 1977, 4260/77
Int. Cl.² A63C 7/10
U.S. Cl. 280—605 **4 Claims**



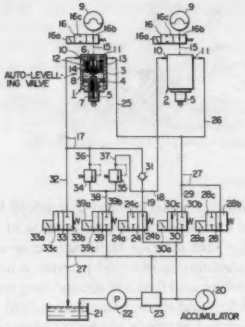
1. In a heel-release binding for holding a ski boot on a ski and having a ski brake coupled thereto, said heel-release binding and said ski brake being pivotal about parallel axes, said heel-release binding being pivotal between a ski boot releasing position and a ski boot holding position, said ski brake being pivotal between a retracted downhill position and an extended braking position, the improvement comprising wherein said ski brake has an operating element engaged directly by the sole of said ski boot, wherein said heel-release binding has a support flange thereon and is free of any permanent direct connection to said ski brake, and wherein said ski brake directly engages said support flange during a pivotal movement of said ski brake from the braking position toward said retracted downhill position, said heel-release binding being forcedly moved by said ski brake during said pivotal movement into said ski boot holding position.

4,216,977

HYDROPNEUMATIC SUSPENSION SYSTEM FOR VEHICLE WITH VALVE MEANS FOR SELECTIVELY KEEPING HYDRAULIC FLUID WITHIN GAS CUSHION

Masayuki Fujii, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 10, 1978, Ser. No. 950,150
Claims priority, application Japan, Nov. 7, 1977, 52-132436
Int. Cl.² B60G 17/06
U.S. Cl. 280—707 **3 Claims**



1. A hydropneumatic suspension system for a vehicle having a body and front and rear wheel units, comprising:

at least one hydropneumatic suspension unit for each wheel unit, said suspension unit including an adjustable strut having a power chamber therein and a gas cushion having a hydraulic fluid chamber connected to said power chamber through a fluid passage, said suspension unit having a first port and a second port;

first electrically controlled supply means for supplying fluid to said first port of said suspension unit;

first electrically controlled discharge means for discharging fluid from said second port of said suspension unit;

valve means associated with said suspension unit for controlling fluid connection between said first port thereof and said power chamber therein and fluid connection between said second port thereof and said power chamber therein;

actuating means responsive to relative movement between the body and said wheel unit for actuating said valve means so as to regulate the level of the body;

second electrically controlled discharge means for discharging fluid from said power chamber of said suspension unit to lower the body;

series connected first and second switch means connected to said first electrically controlled supply means and said first electrically controlled discharge means and operative to prevent said first electrically controlled supply means from supplying fluid to said first port of said suspension unit and to prevent said first electrically controlled discharge means from discharging fluid from said second port of said suspension unit;

a third switch means connected to said second electrically controlled discharge means and operative to permit said second electrically controlled discharge means to discharge fluid from said power chamber of said suspension unit to lower the body; and wherein the improvement being in that

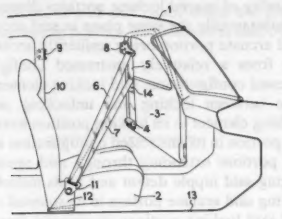
an electrically controlled valve means is fluidly disposed in said fluid passage for selectively closing and opening said fluid passage, and is connected to said third switch means such that when said second electrically controlled discharge means discharges fluid from said power chamber of said suspension unit, said electrically controlled valve means will close said fluid passage.

4,216,978

AUTOMATICALLY POSITIONED SAFETY BELT FOR AN AUTOMOBILE VEHICLE

Gerard Mauron, Versailles, France, assignor to Automobiles Peugeot and Societe Anonyme Automobiles Citroen, both of Paris, France

Filed Oct. 18, 1978, Ser. No. 952,399
Claims priority, application France, Oct. 21, 1977, 77 31768
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—803 13 Claims



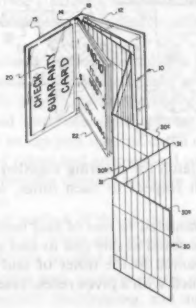
1. A safety belt device for retaining a passenger of an automobile vehicle on a seat of the vehicle, said device comprising a door of the vehicle, a safety belt having a first belt portion, a second belt portion and a third belt portion, a belt winder mounted on the door, a first belt support mounted on the door in an upper rear part of the door, a second belt support constituting an anchoring member located substantially in a central part of the vehicle and fixed relative to the seat, the first belt portion extending between the winder and the first belt support, the second belt portion forming a cross-belt extending between the first belt support and the second belt support, and the second belt portion being extended, in passing round the second belt support, by the third belt portion which constitutes an abdominal belt and has an end part which is connected to the first belt portion so as to cause said end part to be raised under the effect of the extension of the belt when the door is opened.

4,216,979

BANK CHECKING SYSTEM

Daniel Janik, 1861 S. 3rd East, Salt Lake City, Utah 84115

Filed Apr. 5, 1979, Ser. No. 27,527
Int. Cl.[2] B42D *15/00*
U.S. Cl. 283—58 7 Claims



1. A bank checking system comprising:

a cover member which may selectively be opened and laid out flat and closed by folding along a fold line which divides said member into approximately equal halves, each said half carrying receiver means for holding components of said system between said halves when said folding member is closed;

a plurality of bank checks, each carrying indicia near a corner of its face, and each foldable along a pair of approximately parallel fold lines so that a first segment including less than one-third the area of the check is folded over against the face of the check, and a second segment, opposite said first segment and including said indicia is foldable towards said first segment, said plurality of checks being held in stacked arrangement by one of said receiver means such that the first said segment of each check is held between the face of that check and the back of an adjacent check and the second segment of each check is oriented parallel the corresponding second segments of the other of said plurality of checks so that they may be folded simultaneously for containment between the halves of said folding member when said folding member is closed and unfolded when said folding member is opened so that any of said checks may selectively be removed from said stacked arrangement without disturbing the remaining checks; and

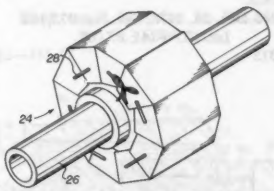
register means, including a continuous sheet held by the other of said receiver means and folded into segments defined by a series of approximately parallel fold lines, alternating segments being folded in opposite directions so that the entire sheet may be collapsed for containment between the halves of said folding member when said folding member is closed and extended for the entry of data when said folding member is opened.

4,216,980

SAFETY SHIELD FOR FLANGED PIPE COUPLING

Marshall T. Shreve, Sulphur, La., assignor to Martec Industries Inc., Sulphur, La.

Filed Oct. 23, 1978, Ser. No. 953,455
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—13 13 Claims



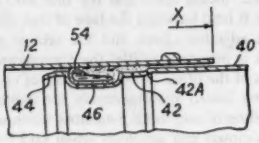
1. A safety shield for a flanged pipe coupling comprising an elongated, flexible translucent strip of a fluoroalkene polymeric material, adaptable to be wrapped around the circumference of the pipe coupling flanges having a length somewhat greater than the circumference of said flanges, and having sufficient width to permit the longitudinal edges of the shield to be folded toward and approach in a non-sealing manner the outside diameter of a pipe received in the flange, said longitudinal edges being segmented so that when the shield is wrapped around said flanges a portion of each segment overlaps a portion of the segment juxtaposed thereto, permitting escape therebetween of a measured amount of fluid that might leak from said pipe coupling, and a plurality of the segments having means receiving a pliable lace therethrough for securing the shield in a fixed position on the flanges said lace being derived from a fluoroalkene polymeric material.

4,216,981

CONNECTING LENGTHS OF TUBING

Tor A. Jensen, Bösingen, Switzerland, assignor to Spiro Investment S.A., Bösingen, Switzerland

Filed Aug. 1, 1978, Ser. No. 929,986
Claims priority, application United Kingdom, Aug. 5, 1977, 33023/77
Int. Cl.² F16L 17/00
U.S. Cl. 285—97 4 Claims



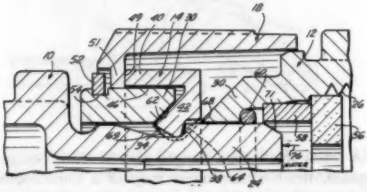
1. In a sealing assembly for providing a circumferential seal along an inner wall face of a tubing; the improvement comprising a sleeve arranged inside said tubing substantially coaxially therewith; means defining a circumferential recess in said sleeve; a sealing member including a hollow flexible ring seated in said circumferential recess substantially coaxially with said sleeve; said ring having, about its circumference, a plurality of axially spaced flexible annular flanges; said ring having a non-inflated state and an inflated state; in the inflated state fluid injected into said ring expands it radially outwardly for pressing said ring circumferentially against said inner wall face of said tubing; one of said annular flanges being a leading flange and another of said flanges being a trailing flange; said annular flanges increasing in height from said leading flange to said trailing flange; and means defining, adjacent said circumferential recess, an additional recess for accommodating the trailing flange when in engagement with and bent over by the tubing; the depth of said additional recess being less than the thickness of said trailing flange whereby said trailing flange maintains the tubing out of contact with said sleeve.

4,216,982

SPEED SLIP-ON HOSE COUPLER

Ho Chow, River Edge, N.J., assignor to Beatrice Foods Co., Moonachie, N.J.

Filed Dec. 26, 1978, Ser. No. 973,114
Int. Cl.² F16L 37/18
U.S. Cl. 285—315 10 Claims



1. In a speed slip-on hose coupler comprising:

(A) a male hose attachable body formed with a nipple having a detent;

(B) a female hose attachable body formed with a sleeve for receiving said nipple with a slip-on fit to a locking position, said sleeve having a wall portion defining a plurality of spaced openings therethrough;

(C) locking means for interlocking said male and female bodies, said locking means being movable between locking and unlocking positions; and

(D) a releasing device mounted on said female body and having a part engageable with said locking means, said releasing device being axially slidable on said female body between coupler connecting and disconnecting positions, movement of said releasing device to its coupler connecting position acting to permit said locking means to move to its locking position and reverse movement of said releasing device to its coupler disconnection position acting on said locking means to move the same to its unlocking position;

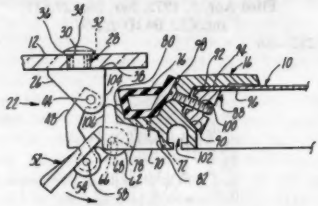
the improvement wherein said locking means comprises a unitary element having an arcuate portion disposed at least partially around said sleeve wall portion and a plurality of spaced locking portions disposed along and in substantially the same plane as said arcuate portions, said arcuate portion being resiliently arcuately expansible from a relatively unstressed configuration to a stressed configuration, said locking element being movable between locking and unlocking positions, said locking element in its locking position having said arcuate portion in its unstressed configuration and said locking portions extending through said openings and engaging said nipple detent and in its unlocking position having said arcuate portion in its stressed configuration and said locking portions disengaged from said nipple detent; said arcuate portion biasing said releasing device to its coupler connecting position and said locking element to its locking position; and said openings being configured and dimensioned so that said reverse movement of said releasing device to its coupler disconnection position displaces said locking element to its unlocking position, without pivoting said locking portions, by causing said locking portions to cam along said sleeve wall portion defining said openings in a movement having a radially outward component relative to the axis of said nipple and thereby causing said arcuate portion to expand radially outwardly and said locking portions to disengage from said nipple detent.

4,216,983

DETACHABLE SUNROOF FOR AUTOMOBILES

Louis E. Hough, St. Clair Shores, and David C. Shifflett, Sterling Heights, both of Mich., assignors to Empire Automotive, Inc., Roseville, Mich.

Division of Ser. No. 851,973, Nov. 16, 1977. This application Mar. 5, 1979, Ser. No. 17,515
Int. Cl.² E05C 17/32; B60J 7/18
U.S. Cl. 292—263 5 Claims



1. An overcenter latch for securing together members relatively movable with respect to each other, said overcenter latch comprising:

a pedestal block mounted to one of said members;

a link pivotally mounted at one end to said pedestal block;

a catch block mounted to the other of said members, said catch block formed with a pivot recess extending into said catch block;

a lever handle pivotally mounted to the other end of said link from said one end;

a first pivot pin removably locatable within said pivot recess formed in said catch block by movement of said lever handle on said pivotal mount to said link and said movement of said link on said pivotal mounting on said pedestal block;

a handle portion formed on said handle lever adapted to rotate said lever handle about said first pivot pin with said first pivot pin disposed in said pivot recess to draw said pedestal block toward said catch block by rotation on said link, said lever handle being rotatable therein until the center line of said pivotal mount between said link and said lever handle passes over center of said pivotal mounting of said one end of said link of said pedestal block; and

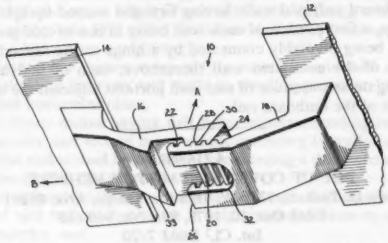
stop means locating said lever handle in said position overcenter with said pivotal mounting overcenter whereby said pedestal block and said catch block are drawn into said corresponding position and latched in said overcenter position.

4,216,984

AUTOMATIC LOCKING LATCH

Robert A. Hofmann, and David W. Kusche, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Jan. 8, 1979, Ser. No. 1,436
Int. Cl.[3] E05C *11/00*
U.S. Cl. 292—91 **6 Claims**



1. A latch for use with removable outboard motor cowls comprising:

a first catch, attached to a first cowl member;

an area on a surface of said first catch which contains a first series of multiple parallel ridges and grooves running transverse to the final direction of motion of closing of the cowls, said area lying in a plane parallel to said direction of closing;

a semi-rigid second catch, attached to a second cowl member to be latched to the first cowl member, oriented to mechanically interfere with the first catch at the leading edges as said cowl members approach each other, and constructed to slip past the first catch onto the area of the first series of ridges and grooves and to maintain one of its surfaces in forcible contact with the first series of ridges and grooves;

an area, on that surface of the second catch which contacts the first series of ridges and grooves, containing a second series of multiple parallel ridges and grooves, the second series of ridges and grooves being parallel to, directly facing, essentially overlapping, and interlocking with the first series of ridges and grooves when the leading edge of the second catch has slipped past the leading edge of the first catch and the latching motion is essentially complete; and

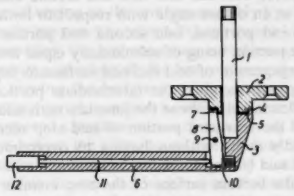
a means of applying force perpendicular to the plane of the ridges and grooves whereby the interlocking ridges and grooves are disengaged.

4,216,985

WINDOW LOCK OPERATING DEVICE

Bendt D. Sorensen, Holte, Denmark, assignor to V. Kann Rasmussen Holding A/S, Denmark

Filed Mar. 23, 1979, Ser. No. 23,389
Claims priority, application Denmark, Apr. 20, 1978, 1733/78
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—336.3 **1 Claim**



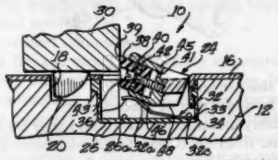
1. A window lock operating device, comprising a bearing member to be firmly secured to the window and including a rotatable lock operating shaft, an L-shaped handle member including a short arm extending substantially co-axially with said shaft and having one end portion firmly connected thereto and a long arm integral with the opposite end portion of the short arm, and a mechanism for arresting said shaft in its locking position, said arresting mechanism comprising a lever housed in said short arm and carried tiltably by a cross pin at a point intermediate the ends of the lever, a notch in said bearing member to receive the adjacent end portion of said lever in one extreme position thereof, a spring urging the lever toward said extreme position, and a push rod guided for longitudinal displacement in said long arm of the handle member and operative to tilt said lever away from said extreme position and out of engagement with said notch against the force of said spring, said push rod having a press-button projecting from the free end of said long arm.

4,216,986

RELEASABLE DOOR STOP ASSEMBLY

Delmar McNinch, Rock Falls, and William K. Schuttler, Sterling, both of Ill., assignors to Lawrence Brothers, Inc., Sterling, Ill.

Filed Aug. 9, 1978, Ser. No. 932,301
Int. Cl.[2] E05C *3/02*
U.S. Cl. 292—341.17 **5 Claims**



1. A releasable door stop assembly for use with a bi-directional swinging door, comprising in combination; a housing for insertion into a mortise formed in a doorway frame associated with said door, and said housing including an inner wall surface; a face plate adapted to be fastened to said doorway frame in registry with said housing, and including an aperture from which a stop member projects, a free floating stop member mounted for compound movement with respect to said housing and including a forwardly facing stop surface for engagement with a door, a rearwardly facing inclined surface, and a bottom surface; said bottom surface of the free floating stop member being provided by a generally forward planar segment and a contiguous, generally planar rearward segment disposed at an obtuse angle with respect to said forward segment, which

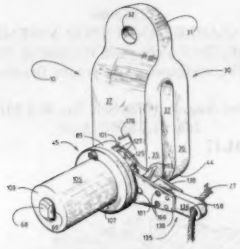
planar segments serve to define generally forward and rearward portions of said stop member; and a leaf spring member disposed between said bottom surface and the inner wall of said housing, said leaf spring member biasing said stop member outwardly of said housing, and including, a first end portion which is fixed, and a second end portion having a curved end segment which engages the bottom surface of said stop member only proximate said forward portion, and an intermediate portion disposed between said first and second end portions and formed at an obtuse angle with respect to both said first and second end portions, said second end portion and said intermediate portion being of substantially equal length, such that upon engagement of said inclined surface to depress said free floating stop member, the intermediate portion of said spring will flex initially, about the juncture with said first end portion, and the rearward portion of said stop member will move inwardly easily without having to overcome the full resistance of said biasing force, such that when said rearward segment of the bottom surface of the stop member bottoms with respect to said housing, said intermediate portion of the leaf spring will also engage said housing, with the continued application of force to said inclined surface causing said stop member to rock forward against the action of said second end portion of said leaf spring member, with said second end portion, due to its substantial length, its curved end segment, and its obtuse relation with respect to said intermediate portion which provides a new point of flexture, forcing said stop member to move rearwardly and upwardly upon said rocking movement, thereby to dispose said inclined surface proximate said plate aperture, to preclude pinching of the operator's finger as the door moves past said stop member.

4,216,987

SAFETY SHACKLE

Robert G. Ely, 2706 W. Ashlan, No. 11, Fresno, Calif. 93705

Filed Oct. 26, 1978, Ser. No. 955,127
Int. Cl.² B66C *1/34*
U.S. Cl. 294—83 R **11 Claims**



3. A safety shackle comprising

A. a clevis having a pair of spaced ends;

B. a pin slidably mounted on one of said ends for movement toward and from the other of said ends between a closed position extended between said ends and an open position retracted from said other end;

C. resilient means urging the pin toward said open position;

D. means releasably interconnecting the clevis and the pin for selectively retaining the pin is a closed position against the urging of the resilient means; and

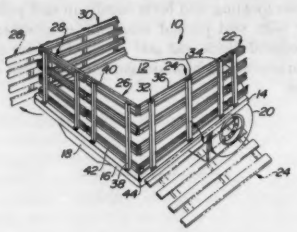
E. means for releasing said interconnecting means from a position remote from the clevis so that the pin is urged from the closed position by the resilient means, the releasing means including oscillating means mounted on the clevis, an elongated member having an end connected to the oscillating means and extended therefrom to an opposite end disposed at said remote position, and the releasing means being adapted to release the interconnecting means when the oscillated means is repeatedly oscillated from said remote position by the elongated member.

4,216,988

VEHICLE BODY HAVING PIVOTABLE SIDE WALLS

Robert L. Weiss, West Lawn, Pa., assignor to Reading Body Works, Inc., Reading, Pa.

Filed Oct. 26, 1978, Ser. No. 955,080
Int. Cl.² B60P *7/06*
U.S. Cl. 296—43 **9 Claims**



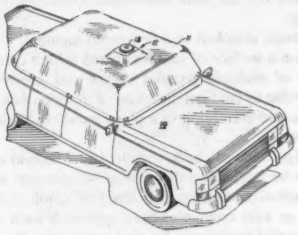
1. A vehicle body having a floor supported by a chassis and wheeled running gear, said body having vertically disposed walls, means supporting said walls for pivotable movement about horizontal axes so that the walls pivot outwardly through an arc of more than 90 degrees and not more than 180 degrees, said means including pockets on the upper surface of the floor adjacent the periphery of the floor but inwardly of an outboard rail, said walls having first and second upright portions, a first portion of each wall being in one of said pockets and being pivotably connected by a hinge to the second portion of the associated wall thereabove, each of said hinges being on an outerface of said wall portions adjacent the upper edge of the outboard rail.

4,216,989

POP-UP COVER FOR MOTOR VEHICLE

Melvin G. Tackett, 1315 W. 16th St., Tempe, Ariz. 85281

Filed Oct. 10, 1978, Ser. No. 949,665
Int. Cl.² B60J *7/20*
U.S. Cl. 296—136 **1 Claim**



1. A protective covering system for a vehicle, comprising:

(a) a compartment defined on said vehicle,

(b) a flexible sheet member, said sheet member being readily collapsible and adapted to be folded into said compartment for storage therein between use, and

(c) cover means movably connected to said compartment for providing access to the interior thereof and having at least two operative positions,

(i) an open operative position with said cover means displaced from and providing access to said compartment such that said sheet member may be removed from said compartment and deployed over said vehicle, and

(ii) a closed operative position with said cover means resting on and securing a portion of said flexible sheet member against said compartment,

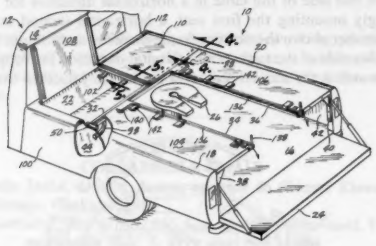
a segment of said sheet member being attached to said cover means, said segment being situated inwardly of said compartment when said cover means is in said closed operative position.

4,216,990

WATERPROOF TRUCK BED COVER

Donovon E. Musgrove; Wilbur D. Vos, and Lyle D. Valintine, all of Sully, Iowa 50251

Filed Jun. 28, 1978, Ser. No. 920,134
Int. Cl.[2] B60J 7/10
U.S. Cl. 296—213 **7 Claims**



1. In combination with a pick-up truck having a bed with rearward and forward ends, opposite sides of upstanding side walls with the upper edges of said side walls defining a horizontal plane and a fifth wheel within said bed below said upper edges, a bed cover, comprising,

a rigid frame means removably secured to said bed and extending between said walls to dwell approximately in said horizontal plane,

said frame means having first brace means extending rearwardly and second brace means extending laterally, said first and second brace means each having a drain channel therein for the drainage of water,

drain means fluidly connecting said channels to the exterior of said bed so that water in said channels drains to said exterior, and

rigid panel means attached to said frame means to cover said bed,

said second brace means comprising a first support member extending laterally between and connected to said opposite upstanding side walls and

said first brace means comprising a second support member attached to and rearwardly extending from said forward end of said bed to said first support member, said second member being connected to said first member,

third and fourth support members spaced apart and rearwardly extending from said first support member to said rearward end of said bed, said third and fourth members being attached to said first support member,

each said support member having a drain channel therein for the drainage of water.

4,216,991

WALL PROXIMITY CHAIR WITH REAR DRIVE LINKAGE

Raymond Holobaugh, Tupelo, Miss., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Jun. 16, 1978, Ser. No. 916,007
Int. Cl.[2] A47C 1/035
U.S. Cl. 297—85 **6 Claims**

1. In a wall-proximity reclining chair of the type having

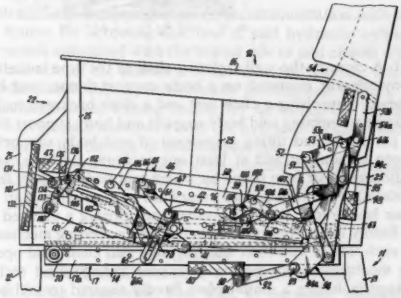
(A) a stationary base for supporting the chair on a floor;

(B) body-supporting means including a seat located generally above the base, and a backrest located generally rearwardly of the seat, said body-supporting means having a pair of seat-mounting members each located at an opposite side of the seat, and a pair of backrest-mounting members each located at an opposite side of the backrest;

(C) a movable armrest assembly mounted for longitudinal horizontal reciprocating movement relative to the base, including a pair of armrests each located at an opposite side of the seat, and a pair of interconnected armrest-mounting members each mounted on a respective armrest for moving the armrest assembly forwardly and rearwardly as a unit relative to the base in response to manual urging on the armrest assembly by a seated user;

(D) body support-to-armrest linkage means kinematically connecting the seat-mounting members and backrest-mounting members to the armrest-mounting members, for moving the body-supporting means from an end-limiting upright position in which the seat and backrest are spaced a predetermined distance away from a room wall behind the chair, to an intermediate TV position, and thereupon to an end-limiting fully reclined position in which the seat and backrest are forwardly spaced at a greater distance from the room wall such that physical contact of the body-supporting means with the room wall is avoided in all of said positions,

said body support-to-armrest linkage means including lifter means kinematically connected to the front portion of each seat-mounting member and operative for changing the orientation of the seat relative to the base by moving the front portions of the seat-mounting members in a generally vertical direction; and



(E) a footrest assembly operatively connected to said body support-to-armrest linkage means at the front of the chair, for successively extending a footrest forwardly and upwardly of the base when the body-supporting means moves from its upright towards its fully reclined position;

the improvement comprising:

rear drive linkage means operatively connecting the body support-to-armrest linkage means to the base along a force-transmitting path which extends rearwardly of the footrest assembly, and operative for controlledly driving the body support-to-armrest linkage means to thereby effect movement of the body-supporting means between its positions, said rear drive linkage means including at opposite sides of the seat

(a) a bent pivot link having one end pivotally connected to the armrest-mounting member, and an opposite end;

(b) a bell crank link having one arm pivotally connected to the lifter means, another arm having a drive pivot point, and an intermediate portion pivotally connected to the opposite end of the bent pivot link;

(c) a drive control link having one end pivotally connected at said drive pivot point of the bell crank link and an opposite end;

(d) a drive link having one arm pivotally connected to the opposite end of the drive control link, another arm having a driven pivot point, and an intermediate portion pivotally connected to the body support-to-armrest linkage means;

(e) an idler link having one end pivotally connected at the driven pivot point of the drive link, and an opposite end pivotally connected to the base; and

(f) said links together constituting a linkage train which kinematically connects each movable armrest-mounting member to the stationary base, for transmitting forces along the train during movement of the body-supporting means between said positions.

4,216,992

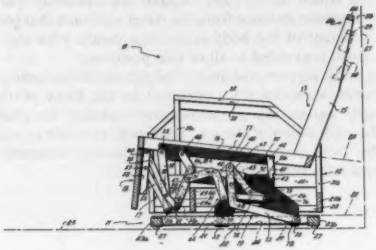
UNITIZED CLOSE-TO-THE-WALL RECLINER CHAIR MECHANISM

McDonald Crum, Louisville, Ky., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Dec. 26, 1978, Ser. No. 972,694

Int. Cl.[2] A47C *1/035*

U.S. Cl. 297—85 **10 Claims**



1. A close-to-the-wall reclining chair of the type including a body support mounted on a body support frame, said body support comprising a chair seat and a chair backrest, recliner linkage connecting said body support and body support frame to permit limited tilting movement of said body support between an upright and at least one reclining position, and a stationary chair base frame on which said body support frame is mounted for forward and rearward motion relative to said chair base frame, the improvement comprising a unitized and all fixedly interconnected reclining chair operating mechanism on each side of said chair for operating said chair, said operating mechanism including said recliner linkage, said recliner linkage including a mount plate fixedly secured to said body support frame,

said operating mechanism further including a roller and track assembly operable between said base frame and body support frame to permit said body support frame to move forwardly and rearwardly relative to said base frame, said roller and track assembly including a track and a plurality of rollers movable within said track,

one of said rollers and track being fixedly attached to said recliner linkage mount plate independently of the body support frame such that said roller and track assembly and said recliner linkage are a unitary assembly, and

a control linkage operatively interconnected between said track and said recliner linkage, said control linkage being operative to effect movement of said body support frame on said chair base frame in response to tilting movement of said body support relative to said body support frame.

4,216,993

TABLE AND SEAT APPARATUS

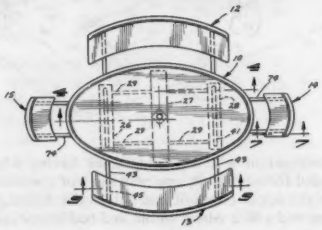
Gordon W. Shumaker, St. Paul, Minn., assignor to Space Tables, Inc., Minneapolis, Minn.

Filed Oct. 26, 1978, Ser. No. 955,027

Int. Cl.[2] A47C *7/62*; A47B *13/00*

U.S. Cl. 297—157 **8 Claims**

1. A table seat combination comprising a table top having a first end portion, a second end portion and opposite sides, said table top including a wood panel having a top surface and a bottom surface, a first and a second support member and plastic material encapsulating the wood panel and support members, a first seat, a second seat, a third seat adjacent and spaced from the table first end portion, a fourth seat adjacent and spaced from the table second end portion, framework means for supporting the first and second seats in an elevated condition, said framework means comprising a first framework and a second framework spaced from the first framework, each of said frameworks including an elongated bottom horizontal frame member having a first end portion below and remote from one side of the table in a horizontal direction and a second end portion below and remote from the other side of the table in a horizontal direction, a horizontal first seat frame member above the bottom frame member and remote from one side of the one side of the table in a horizontal direction for supportingly mounting the first seat, a horizontal second seat frame member above the bottom frame member and remote from the other side of the table in a horizontal direction for supportingly mounting the second seat, first leg means joined to the bottom



frame member first end portion for supporting the first seat frame member, second leg means joined to the bottom frame member second end portion for supporting the second seat frame member, a top frame member joined to the table top and vertically extending third leg means for mounting the top frame member on the bottom frame member, each support member being located between the wood panel and one of the top frame members, a first mount having a horizontal portion that has a first end joined to one of the bottom frame members and an opposite end portion that is remote from the table top first end portion in a horizontal direction and means joined to the first mount horizontal portion opposite end portion for mounting the third seat, and a second mount having a horizontal portion that has a first end joined to the other bottom frame member and an opposite end portion that is remote from the table top second end portion in a horizontal direction and means joined to the second mount horizontal portion opposite end for mounting the fourth seat.

4,216,994

TABLET SIDE ARM FOR CHAIRS

Roland A. Benoit, Danielson, Conn., assignor to Inter Royal Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 918,869

Int. Cl.[2] A47B *17/06*

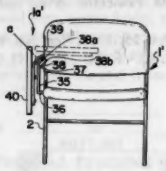
U.S. Cl. 297—162 **37 Claims**

1. Support for mounting a floating tablet on a chair comprising

a side arm positionable at the side of a chair and having laterally facing positioning means thereon disposed in substantially transverse laterally facing direction for positioning the side arm at such side of the chair, and

pivot axis orienting receiving means on the side arm vertically spaced from the laterally facing positioning means and extending upwardly and laterally therefrom in the same corresponding facing direction as that of the laterally facing positioning means and arranged for axially receiving pivot means for pivotally connecting a floating tablet to the side arm on a pivot axis situated with respect

to the side arm for displacing the tablet along a rotational movement path sequentially forwardly and outwardly and thence downwardly and backwardly relative to the horizontal from a substantially horizontal working position extending crosswise of the side arm to a substantially vertical storage position extending laterally of the side arm.

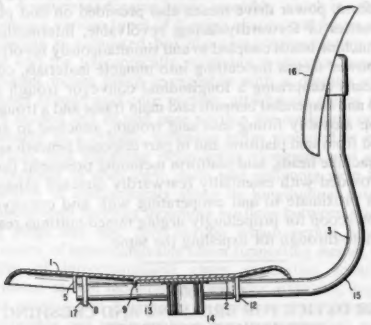


4,216,995

COLLAPSIBLE CHAIR

Yoshisada Inaba, Osaka, Japan, assignor to Shinsei Kinzoku Seisakusho, Osaka, Japan

Continuation of Ser. No. 832,550, Sep. 12, 1978, abandoned. This application Mar. 5, 1979, Ser. No. 16,964
Claims priority, application Japan, Feb. 18, 1977, 52/17301
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—443 **5 Claims**



1. A collapsible chair comprising:

a seat, said seat comprising:

a pair of stops provided on a front bottom surface of said seat;

a pair of first brackets provided on said bottom surface of said seat and corresponding with and adjacent to said stops;

a hole formed in each of said first brackets;

a pair of second brackets provided on a rear bottom surface of said seat and corresponding with said first brackets; and

a hole formed in each of said second brackets;

a plate detachably fixed to said bottom surface of said seat between said first and second brackets, said plate comprising:

curved edges for engaing with a pipe; and

a seat coupling provided on a bottom surface of said plate;

a back rest, said back rest being coupled to said seat by a pair of curved pipes which are coupled to said back rest at one end and whose other end extends through said holes in said first and second brackets, engages with said curved edges of said plate and abuts said stops; and

a seat support post, said seat support post engaging with said seat coupling;

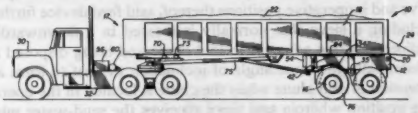
whereby said seat, plate, back rest and seat support post are detachably coupled together to form a chair.

4,216,996

STABILIZER FOR DUMPING VEHICLES

Charlie C. Pitts, 732 Blue Fathom Dr., Bridgeport, Tex. 76026

Filed Nov. 20, 1978, Ser. No. 962,378
Int. Cl.[3] B60P *1/16*; B60T *7/12*
U.S. Cl. 298—17 S **2 Claims**



1. A stabilizer system for a rear dumping vehicle having a chassis which is resiliently supported by at least one wheeled rear axle and a dump body pivotally mounted on said chassis about an axis parallel to at least one rear axle, said dump body moveable between road and dump positions, the stabilizer system comprising:

stabilizing plate means mounted on each side of the chassis, said stabilizing plate means pivotally coupled to said chassis and adapted to selectively engage the wheels of one of said wheeled rear axles;

hydraulic cylinder means associated with each of said stabilizing plate means for urging said stabilizing plate means downward into engagement with said wheels during the major portion of the tipping of said dump body;

a source of hydraulic pressure;

solenoid valve means in fluid flow communication with said source for actuating that one of said hydraulic cylinder means associated with the lowest side of said chassis when one side of the chassis is lower than the opposite side of the chassis thereby substantially leveling said chassis;

pendulum level sensing means for actuating the solenoid valve means associated with the hydraulic cylinder means on the lowest side of said chassis; and

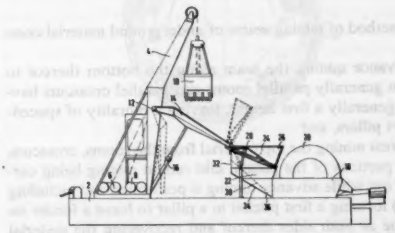
limit switch means adapted to disable said pendulum sensing means when said dump body is positioned in said road position.

4,216,997

GRAB EXCAVATOR WITH FIXED JIB

Horst Fiebig, Brunswick, Fed. Rep. of Germany, assignor to Stichweh Verwaltungs-GmbH, Hameln, Fed. Rep. of Germany

Filed Jan. 24, 1979, Ser. No. 5,973
Int. Cl.[3] E02F *3/44*, *7/06*
U.S. Cl. 299—9 **7 Claims**



1. A grab excavator, comprising a base defined by a floating pontoon, a fixed jib mounted on said pontoon, a grab suspended from said jib, means mounted on said pontoon and interconnected to grab through said jib for vertically moving said grab, wherein said grab is lowered below said pontoon for lifting a mixture of sand and water and thereafter elevated above said pontoon for releasing the mixture, a chute mounted on said jib and pivotal about a horizontal axis thereon for location beneath the grab in an inclined operative position and

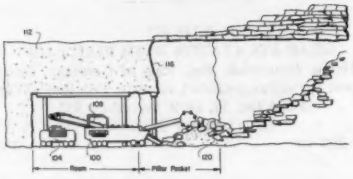
being pivotally movable to a vertical inoperative position and out of the path of said grab, a feed device located at the lower end of said chute when it is disposed in the inclined operative position and receiving the sand-water mixture therein as directed thereto by said chute, a hydraulic ram mounted on said pontoon and engaging the underside of said chute, said ram being operable to pivotally move said chute between the operative and inoperative positions thereof, said feed device further including a sieve that normally is located in a downwardly inclined position adjacent to said chute and being disposed at substantially the same angle of inclination thereof to form an extension of said chute when the chute is located in the operative position wherein said sieve receives the sand-water mixture from said chute for processing through said feed device, and an opening formed in said feed device in the wall thereof that faces in the direction of said chute, said opening receiving therein the mixture of said and water from said chute as the chute is being raised to the full operative inclined position, thereby preventing the loss of fine sand that may escape from said grab before the chute is fully raised to the operative position thereof.

4,216,998

METHOD OF UNDERGROUND MINING BY PILLAR EXTRACTION

Ray J. Bowen, 1879 Delann, Salt Lake City, Utah 84121, and William R. Bowen, 1636 Sunnydale La., Salt Lake City, Utah 84108

Filed May 31, 1979, Ser. No. 44,391
Int. Cl.³ E21C *41/04*
U.S. Cl. 299—11 **10 Claims**



1. A method of mining seams of underground material comprising

(a) advance mining the seam along the bottom thereof to form generally parallel rooms and parallel crosscuts having generally a first height, leaving a plurality of spaced-apart pillars, and

(b) retreat mining the top material from the rooms, crosscuts, and portions of the pillars, said retreat mining being carried out while advance mining is performed and including

(b.1) forming a first pocket in a pillar to leave a fender on one or both sides thereof and recovering the material from the pocket,

(b.2) drilling, charging and shooting the top coal above the pocket,

(b.3) loading the fallen top coal by machinery which allows the operator thereof to remain in a position adjacent to the fallen coal under a roof which has not been shot, and

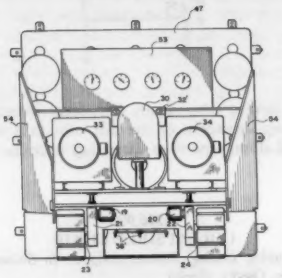
(b.4) charging, shooting, and loading the top coal above that portion of the room adjacent to the pocket and fenders.

4,216,999

MACHINE FOR MINING TAR SANDS HAVING REARWARDLY DIRECTED EXHAUST RELATED TO CONVEYOR TROUGH

Lester Hanson, 1903 Princeton Ave., Salt Lake City, Utah 84108

Filed Oct. 16, 1978, Ser. No. 951,591
Int. Cl.² E21C *27/24, 35/20*
U.S. Cl. 299—57 **3 Claims**



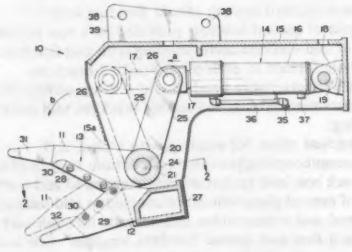
1. A mining machine having a main frame, endless track means supporting said main frame, a platform supported by and pivoted to said main frame for incremental adjustment as to fore and aft disposition, an operator's station provided on said platform, power drive means also provided on said platform, a series of forwardly-facing, revolvable, intermeshed, mining machine heads coupled to and simultaneously revolved by said power means for cutting into minable materials, conveyor means comprising a longitudinal conveyor trough attached to and suspended beneath said main frame and a trough-like scoop movably fitting into said trough, attached to and suspended from said platform and in part disposed beneath said mining machine heads, said platform including pressured fluid means provided with essentially rearwardly directed exhaust jet means proximate to and cooperating with said conveyor trough and scoop for propellingly urging mined cuttings rearwardly there-through for expelling the same.

4,217,000

CUTTER DEVICE FOR BREAKING AND CRUSHING REINFORCED CONCRETE

Matsutaro Watanabe, Ichikawa, Japan, assignor to Watanabe Kaitai Kogyo K.K., Tokyo, Japan

Filed Nov. 29, 1978, Ser. No. 964,673
Claims priority, application Japan, Jun. 23, 1978, 53-76070
Int. Cl.² E21C *37/00*
U.S. Cl. 299—67 **8 Claims**



1. A device for breaking and crushing reinforced concrete, comprising

a cutter assembly including a first cutter body and a second cutter body each having a leading end and a trailing end,

said leading ends each being provided with jaws for clamping and/or crushing the concrete, said second cutter body also having a cutting blade coacting with said jaws;

a shaft mounting said first cutter body for pivoting movement relative to said second cutter body;

a crank arm on said first cutter body; and

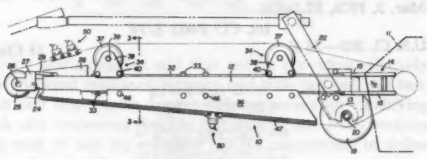
a hydraulic actuator including a piston rod connected to said crank arm, for pivoting said first cutter body relative to said second cutter body to and from a closed position of said cutter assembly.

4,217,001

UNIVERSAL DIGGING BOOM

Stephen A. Youngers, Clearwater, and Sidney B. Neufeld, Wichita, both of Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 11, 1979, Ser. No. 47,504
Int. Cl.³ E21C *25/30*; E02F *5/06*
U.S. Cl. 299—82 **8 Claims**



1. A universal digging boom assembly which is adapted for mounting various types of digging chains, said boom assembly including an elongated, box-like core portion having a hollow first end for telescopically receiving a sprocket means, said sprocket means being engageable with a digging chain entrained around said core portion, attachment means mounted to a second end of said core portion for mounting said boom assembly to a vehicle, stiffening strips mounted to said core portion, said stiffening strips being elongated and generally rectangular in plan view, each said stiffening strip having a plurality of embossments along its longitudinal extent, said embossments forming mounting portions between said stiffening strips and said core portion which permit mounting a plurality of interchangeable chain supporting means, said plurality of interchangeable chain supporting means being mounted to said mounting portions for attaching, supporting, and guiding said digging chain, said supporting means being removable and replaceable with other supporting means depending on the type digging chain being used without removing said boom assembly from said vehicle.

4,217,002

SIMULATED WIRE WHEEL COVER

Lee Simpson, 220 Clovis Ave., Apt. 102, Clovis, Calif. 93706

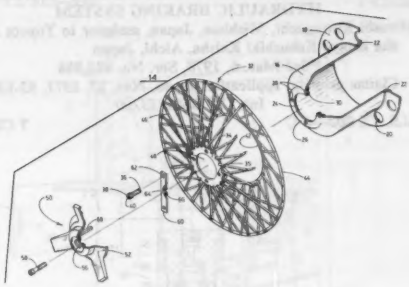
Filed May 3, 1979, Ser. No. 35,781
Int. Cl.³ B60B *7/04*
U.S. Cl. 301—37 CM **4 Claims**

1. A wheel cover simulating a wire wheel particularly adapted to be mounted on and readily removed from wheels for vehicles including trucks, trailers and the like comprising:

A. means for encasing one end of a wheel-supported axle including a casing of a cylindrical configuration having an annular flange defined at one end thereof characterized by an array of apertures defined therein for receiving bolts employed in connecting a wheel to the axle;

B. a cover disk concentrically related to said casing comprising means defining a first and a second annulus arranged in coaxial alignment, said first annulus being characterized by a diameter slightly less than the diameter of said casing and said second annulus being characterized by a diameter slightly greater than the diameter of the casing, a third annulus having a diameter greater than the diameter of said second annulus circumscribing said casing and disposed in a plane projected between the first and second annuli and a plurality of wire spokes projected from said third annulus into engaged relation with the first and second annuli and affixed thereto; and

C. fastening means for fastening the cover disk to the casing comprising a first annular array of bores defined in the end



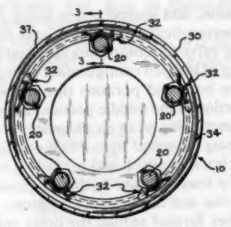
of the casing opposite said one end, a second annular array of bores defined in the first annulus disposed in registry with the first array of bores and a plurality of screws extended through the bores of said first and second array of bores, and fastener means for securing the screws in the bores.

4,217,003

WHEEL TRIM ATTACHMENT

John A. Main, Plymouth, Mich., assignor to Kelsey Hayes Co., Romulus, Mich.

Continuation-in-part of Ser. No. 895,213, Apr. 10, 1978, abandoned, which is a continuation of Ser. No. 701,640, Jul. 1, 1976, abandoned. This application Oct. 1, 1979, Ser. No. 80,102
Int. Cl.³ B60B *7/02, 7/06*
U.S. Cl. 301—37 S **11 Claims**



1. A trim attachment for a motor vehicle wheel having a plurality of wheel fasteners, such fasteners disposed about a circle and each defining a first frusto-conical surface, such first frusto-conical surfaces conjunctively defining a first frusto-conical reference band, said trim attachment having a plurality of retention means for engaging said first frusto-conical surfaces, each of said retention means comprising a second frusto-conical surface, at least a portion of said second frusto-conical surfaces conjunctively defining a second frusto-conical reference band substantially identical to said first frusto-conical reference band, said retention means each further including a

stop means at one end of said second frusto-conical surface for abutting said wheel fasteners and a resilient boss means disposed at the other end of said second frusto-conical surface for retaining said trim on said wheel fastener.

4,217,004

CONTROLLING MEANS FOR A DUAL VEHICLE HYDRAULIC BRAKING SYSTEM

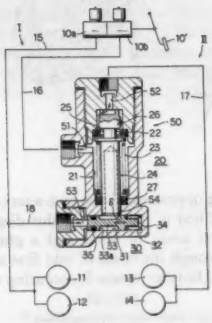
Hiroshi Kawaguchi, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 6, 1978, Ser. No. 883,854

Claims priority, application Japan, Nov. 17, 1977, 52-138333

Int. Cl.³ B60T *13/00*

U.S. Cl. 303—6 C **7 Claims**



1. In a dual hydraulic brake system for automotive vehicles including a master cylinder for generating a brake hydraulic pressure, being related with the depressing degree of the braking pedal, wheel cylinders disposed on each of the front and rear wheels of a vehicle, a pair of mutually independent circuits for connecting said master cylinder and said wheel cylinders, and a regulating valve disposed at least in one of said circuits for controlling the master cylinder brake hydraulic pressure delivered to said wheel cylinders over a certain predetermined level,

the improvement comprising, in combination, an operation restricting mechanism including:

a first piston;

a second piston, said second piston being disposed substantially in perpendicular relation to said first piston in said regulating valve for controlling said brake hydraulic pressure, being of stepped configuration having a non-recessed portion on both end portions thereof and a circular recessed portion in the middle portion thereof, said recessed portion functioning as an air chamber for said first piston;

a branch piping branched from a first circuit independent of a second circuit in which said regulating valve is mounted, for directly leading brake hydraulic pressure of said first circuit to one end of said second piston;

an air chamber formed around the other end of said second piston;

a spring engaged with said second piston on the other end thereof in said air chamber formed around the other end of said second piston for biasing said second piston in the opposing direction to the brake hydraulic pressure in said first circuit;

a first cylinder accommodating said second piston for allowing the same to axially reciprocate therein;

a second cylinder; and

a communicating bore portion formed between said first cylinder and said second cylinder, said second cylinder accommodating said first piston for allowing said first piston to slidingly fit therethrough;

whereby the hydraulic pressure in said first circuit, when exceeding a certain predetermined value, causes said second piston to be shifted toward one end, overcoming the spring force of said spring, for allowing an end portion of said first piston to fit into said recessed portion, thereby effectuating the controlling of the brake hydraulic pressure by said regulating valve, and, on the other hand, when being below said certain predetermined value, causes said second piston to be shifted toward the other end by the spring force of said spring to block operation of said first piston due to abutment of the end portion of said first piston onto a peripheral surface of a non-recessed portion of said second piston thereby suspending controlling operation of the brake hydraulic pressure by said regulating valve.

4,217,005

DECELERATION RESPONSIVE LOAD RESPONSIVE BRAKE PRESSURE CONTROL DEVICE

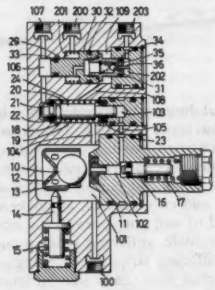
Koji Takata, Itama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 31, 1979, Ser. No. 8,338

Claims priority, application Japan, Feb. 3, 1978, 53-11594; Mar. 3, 1978, 53-24836

Int. Cl.² B60T *8/14*

U.S. Cl. 303—24 F **13 Claims**



1. A brake pressure control device for a vehicle braking system having a first fluid circuit and a second fluid circuit for supplying fluid under pressure to rear brakes, a single deceleration sensing means only in the first fluid circuit, and means responsive to said deceleration sensing means and to the load of the vehicle by means of fluid pressure sealed in said control device upon the occurrence of a deceleration sensed by said deceleration sensing means.

4,217,006

DRIVE BELT ASSEMBLY FOR SNOWMOBILES

Douglas K. Dehnert, St. Hilaire, Minn., assignor to Arctic Enterprises, Inc., Thief River Falls, Minn.

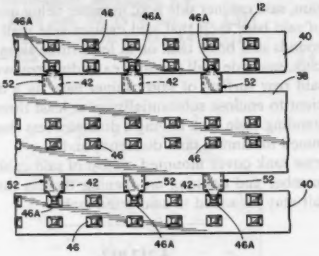
Filed Aug. 17, 1978, Ser. No. 934,514

Int. Cl.² B62D *55/24*

U.S. Cl. 305—35 EB **2 Claims**

1. A drive belt assembly for a snowmobile, said snowmobile being of the type which includes a frame and a frame and a slide rail for operatively suspending said drive belt assembly relative to said snowmobile frame, said drive belt assembly comprising, in combination, a flexible drive belt having an inner side and an outer ground engaging side, said slide rail operatively bearing against said inner side of said drive belt, said flexible drive belt having a central continuous section and a pair of laterally spaced continuous side sections, a plurality of longitudinally spaced elongated portions for connecting each of said side sections with said central section, a plurality of unitary lug members projecting from said inner side of said belt sections and being substantially proximate to said connecting portions and a plurality of formed rigid metallic members, each said rigid member having a first section fixed to one of said

connecting portions in a substantially surrounding relationship thereto and having an offset section, each offset section having a side section and a top section, said top section and said side section being substantially adjacent one lug member, said offset section and said one lug member thereby defining means for protecting and supporting said rigid metallic members for substantially avoiding breakage during use, said first sections



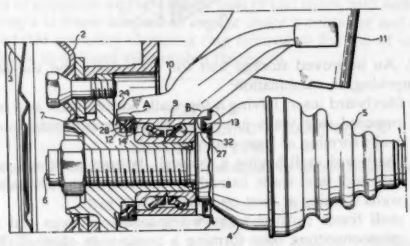
slidably bearing against said slide rail for providing relatively low frictional resistance between said slide rail and said belt, each said first section further defining means for rigidifying each said connecting portion, and each of said offset sections and each of said lug members further cooperating to define means for laterally guiding said slide rail relative to said drive belt.

4,217,007

DEVICE FOR THE SEALING AND PROTECTION OF A MOTOR VEHICLE WHEEL BEARING

Eugenio Filippa, Piossasco, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jan. 15, 1979, Ser. No. 3,682
Claims priority, application Italy, Jan. 23, 1978, 67117 A/78
Int. Cl.[2] F16C *33/78*
U.S. Cl. 308—36.2 **7 Claims**



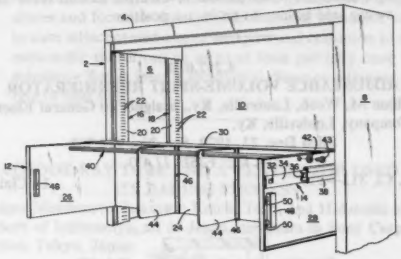
1. A motor vehicle wheel bearing assembly comprising a mounting, a bearing, rotary means supported within the mounting by the bearing, and a device for the sealing and protection of the wheel bearing comprising: a pair of annular sealing elements of elastomeric material, spaced apart axially on the mounting, each sealing element having an oblique contact lip which makes sealing contact with a respective cooperating face of the rotary means: an annular screw-threaded first metal support member in screw-threaded engagement with one end of the bearing mounting, one of the sealing elements being attached to said first support member; and an annular second metal support member to which the other sealing element is attached, said second support member being fitted to the bearing mounting on the opposite side of the bearing from said first support member.

4,217,008

DOCUMENT STORAGE SYSTEM

David M. Wright; Jerome O'Toole, both of Shrewsbury, and Norman A. Hedstrom, Worcester, all of Mass., assignors to Wright Line Inc., Watertown, Mass.

Filed Mar. 29, 1976, Ser. No. 671,614
Int. Cl.[2] A47B *63/00*
U.S. Cl. 312—184 **5 Claims**



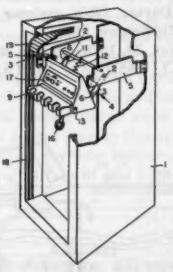
1. A filing cabinet containing at least one book storage unit movable into and out of said cabinet and stationary hanger means disposed on said storage unit for (a) detachably supporting a plurality of books in a storage position in which the pages thereof depend downwardly and (b) permitting any one of said books to be pivoted from said storage position to a supported reading position in which the pages thereof face up and may be opened and read in situ, said storage unit having opposite side members, and said hanger means being a rod secured to and extending between said side members, said rod having at least one flat surface extending for substantially its full length between said said members and being adapted to be used with hook means carried by each of said books so as to permit a selected one of said books to be pivoted about said rod from said storage position to said reading position and also to be removed from said rod without detaching said rod from said storage unit only when pivoted to a selected position.

4,217,009

DENTAL CABINET APPLIANCE

Edwin Suter, Karlsruhe, Fed. Rep. of Germany, assignor to Sybron Corporation, Rochester, N.Y.

Filed Dec. 20, 1978, Ser. No. 971,363
Int. Cl.[2] A61C *19/02*; A47B *81/00*
U.S. Cl. 312—209 **4 Claims**



1. A dental unit comprising:
(a) a cabinet having side walls and an open front;
(b) an instrument holder for releasably supporting a plurality of dental instruments, said holder being movable from a stored position within said cabinet through said open front to an in-use position;
(c) a four-bar linkage connecting said instrument holder to

said cabinet side walls including a pair of lever arms each pivotally connected at a first end to said side wall and each pivotally connected at a second end to said instrument holder for swinging said instrument holder in a vertical plane out and up from a first, relatively low storage position in said cabinet, to a second, in-use position outside of said cabinet; and

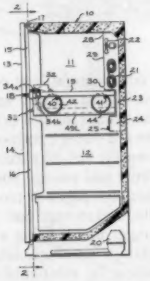
(d) said lever arms having their second ends spaced further apart than said first ends to rotate said instrument holder in a direction towards said lever arms as said lever arms swing said holder to an in-use position.

4,217,010

ADJUSTABLE VOLUME-SPLIT REFRIGERATOR

William M. Webb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 22, 1978, Ser. No. 972,569
Int. Cl.[2] F25D *11/00*
U.S. Cl. 312—214 **11 Claims**



1. An improved adjustable volume split refrigerator of the type having fresh food and freezer compartments separated by a common partition, the front frame of the refrigerator having a fixed mullion aligned with common partition and separating the compartment openings, the improvement comprising:

(a) partition movement means for providing reciprocal translation of the common partition to vary the volume ratio of the two compartments; and

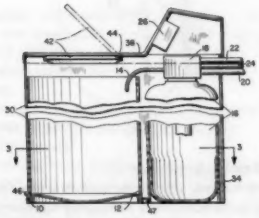
(b) means extensibly coupling the partition to the fixed front mullion for maintaining the separation of the two compartments as the partition is moved.

4,217,011

WATER SOFTENER CABINET

Stephen H. Davis, Dayton, Ohio, assignor to Water Refining Company, Inc., Middletown, Ohio

Filed Nov. 28, 1978, Ser. No. 964,575
Int. Cl.[2] B65D *7/00*; A47B *83/00*
U.S. Cl. 312—237 **17 Claims**



1. A cabinet for enclosing a water softening system, said system including a free standing resin tank containing a water treatment resin and a brine tank for storage of a brine solution which, when circulated through said resin tank, restores the water treatment efficacy of the resin, comprising:

a horizontal cabinet base defining a rear surface for abutting the side of said free standing resin tank,

a cylindrical brine tank side wall member, mounted on top of said base and forming a brine tank therewith,

an integrally formed cabinet side wall member having a vertical front wall portion and a pair of vertical side wall portions extending rearwardly from said front wall portion, said cabinet side wall member being mounted on top of said base such that said cabinet side wall member surrounds said brine tank on at least three sides of said brine tank, said side wall portions extending rearwardly beyond said rear surface of said cabinet base by a distance sufficient to enclose substantially on at least three sides a free standing resin tank having a diameter less than a predetermined maximum tank diameter, and

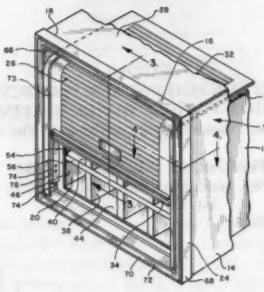
a brine tank cover mounted on top of said cabinet side wall member and defining an opening therein through which salt may be added to said brine tank.

4,217,012

STORAGE UNIT

Gerald R. Klaus, St. Charles, Ill., assignor to Fellowes Manufacturing Company, Itasca, Ill.

Filed Nov. 27, 1978, Ser. No. 963,997
Int. Cl.[2] E06B *9/14*; A47B *81/00*
U.S. Cl. 312—292 **7 Claims**



1. An improved storage unit for documents and the like, comprising, in combination:

a fiberboard insert having a top wall, bottom wall, and two opposed side walls extending therebetween, said insert walls forming at least one open end;

a fiberboard shell having a top wall, bottom wall, and two opposed side walls extending therebetween, said shell walls forming at least one open end;

a shell frame formed with two spaced-apart legs and an interconnecting base forming a continuous channel that receives the edge of said open end of said shell;

a flexible door;

said insert being disposed within said shell with said top wall of said insert and said top wall of said shell being spaced apart to define a door storage space therebetween; said flexible door being of suitable height to be partially disposed within said door storage area when enclosing said open end of said shell;

said flexible door being guided at its opposed side edges by tracks extending along the side walls of said shell, said tracks each being formed of a front and a rear rail;

said front rails being secured to the inward legs of said frame; and

said rear rails each comprising a forward face, which together with said front rail define a guide path for said flexible door side edge, and a base extending away from said front rail, said base including means for maintaining

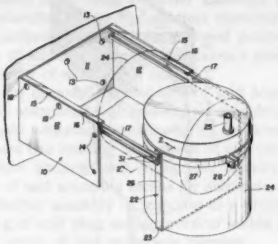
said rear rail in a fixed position relative the adjacent inward leg of said frame and for removing said rear rail from said frame.

4,217,013

CONTAINER SUPPORT

George B. Herrington, 216 Longmeadow Rd., Belvedere, S.C. 29841, and Earl J. Allen, North Augusta, S.C., assignors to George B. Herrington, Belvedere, S.C.

Filed Jan. 10, 1979, Ser. No. 2,311
Int. Cl.[2] A47B *88/00*; A47F *5/12*
U.S. Cl. 312—322 2 Claims



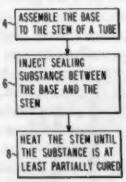
1. A support for a bulk liquid container or the like comprising a mounting bracket of U-formation having an apertured base plate for attachment selectively to a vertical surface or a horizontal surface, said bracket including a pair of parallel side plates projecting from the base plate substantially at right angles thereto, said side plates having apertures along their ends away from the base plate and having other apertures along correcponding longitudinal edges thereof, a pair of extensible and retractable telescoping bar slides adapted to be selectively attached to said side plates along said ends away from the base or along said corresponding longitudinal edges by the use of said apertures along said ends or along said longitudinal edges in conjunction with separable fasteners engaging said apertures, and a basket for holding a bulk liquid container having trunnions thereon near its top and on opposite sides thereof and said trunnions being attached to leading end portions of extensible and retractable bars of said slides, said basket having a U-frame adapted to engage under a container and an adjustable container clamping ring secured to the top of said U-frame in unitized relationship therewith.

4,217,014

METHOD FOR ASSEMBLING A BASE TO AN ELECTRON TUBE

Joseph J. Piascinski, Leola, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1979, Ser. No. 8,176
Int. Cl.[2] H01J *9/30*
U.S. Cl. 316—17 5 Claims


4
ASSEMBLE THE BASE TO THE STEM OF A TUBE
6
INJECT SEALING SUBSTANCE BETWEEN THE BASE AND THE STEM
8
HEAT THE STEM UNTIL THE SUBSTANCE IS AT LEAST PARTIALLY CURED

1. A method for assembling a base to the stem of a vacuum electron tube, said stem including a glass wafer and a plurality of electrically-conducting pins therethrough, with one of said pins for carrying a substantially higher voltage than the pins adjacent thereto during the operation of said tube, and said base being adapted to be mated to said stem with said pins extending through apertures in said base, the steps including

(1) positioning said base in said mating position on said stem with said pins extending through said apertures,

(2) filling substantially all of the space between said base and said stem at least around said one pin with a sealing substance that is at least partially curable by heating to a solid, dielectric material,

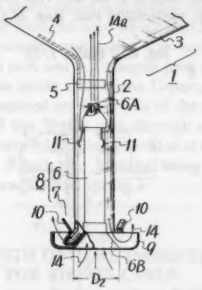
(3) and then heating said wafer and said pins to such temperatures and for such time periods that said substance starts to cure adjacent said one of said pins and continues to cure outwardly therefrom so as to at least partially cure said substance for at least a substantial distance adjacent said one of said pins.

4,217,015

CATHODE RAY TUBE AND A VENTILATOR USED IN ITS BAKING PROCESS

Shigeo Matsumoto, Inazawa; Koichi Tago, and Hidetoshi Kato, both of Ichinomiya, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1978, Ser. No. 966,667
Claims priority, application Japan, Dec. 9, 1977, 52/148606
Int. Cl.[2] H01J *9/20, 9/38*
U.S. Cl. 316—30 3 Claims



1. Apparatus for ventilating a cathode ray tube having a panel portion, and a funnel portion having a tubular neck portion with an open end comprising, a hollow pipe extending into the open end of said tubular neck portion and its inner end terminating prior to said panel portion, the outer end of said pipe formed into a conical shaped flange so that the inner diameter increases with distance from the end of said tubular neck portion so as to form an opening at its outer end larger than the inner opening of the portion of said pipe within said tubular neck portion, and spring holder means attached to said hollow pipe and engageable with said tubular neck portion so as to support said hollow pipe within said cathode ray tube and to space said conical shaped flange away from said tubular neck portion so that air can pass up through said hollow pipe and out of said cathode ray tube between said tubular neck portion and the outer surface of said hollow pipe by natural convection.

4,217,016

ROTARY ELECTRIC RECEPTACLE

Terry G. Seelenbinder, Elk Grove Village, Ill., assignor to AM International, Inc., Los Angeles, Calif.

Filed Jan. 15, 1979, Ser. No. 3,203
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—5 M 9 Claims

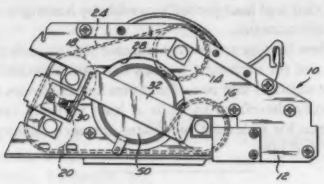
1. An electric receptacle comprising:

an annular nonrotating housing;

a rotor within the housing comprising a disk dividing the

housing into two substantially noncommunicating compartments;

a brush on each face of the disk within its individual compartment including integral contactor means for making electrical contact with a rotary device; and



a slip ring in each compartment surrounding the corresponding brush and contacted by the same on its radially inward surface.

4,217,017

ANGLE ADAPTER FOR AN ELECTRICAL COMPONENT

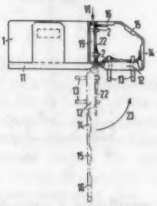
Wolfgang Huebner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 3, 1978, Ser. No. 930,500

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 7726886

Int. Cl.[2] H05K *1/18*

U.S. Cl. 339—17 F **15 Claims**



1. An angle adapter system for an electrical component, comprising:

an electrical component having a number of contact pins; an angle adapter comprising

(a) a base member comprised of an insulating material;

(b) a given number of conductor elements at least corresponding to the number of contact pins of the component to be contacted;

(c) a number of adapter contact pins anchored to the base member at least equal to the given number;

(d) said base member having a planar carrier plate, said component being mounted on the carrier plate such that its contact pins are substantially parallel to the planar plate, and a terminal strip means for accommodating the adapter contact pins and for rigidly positioning them at substantially right angles to the component contact pins;

(e) said conductor elements comprising conductor paths on a flexible printed-circuit board connecting the adapter contact pins and the contact pins of the component; and

(f) means for rigidly supporting the terminal strip means to allow manually plugging the adapter pins and attached electrical component into a circuit with the electrical component at substantially right angles to its normal plug-in position without an adapter.

4,217,018

ELECTRICAL SUPPLY TRACK

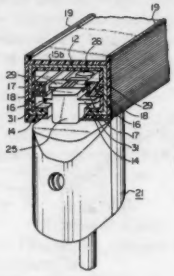
Makoto Yoshida, Moriguchi; Nobutsugu Nagashima, Neyagawa; Akihiro Suzue, Hirakata; Ryuichi Kitagawa, Hikone, and Misao Namikawa, Kusatsu, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Aug. 29, 1978, Ser. No. 937,829

Claims priority, application Japan, Aug. 31, 1977, 52-105288

Int. Cl.[3] H01R *9/00*; H02G *5/04*

U.S. Cl. 339—21 R **1 Claim**



1. An electrical supply track comprising a case core of a steel plate formed into a channel shape having a longitudinal aperture, a coating of a synthetic resin formed intimately on the inner and outer surfaces of said core plate, said coating comprising an inner layer formed on the inner surface and an outer layer on the outer surface of the core plate, a pair of supporting members molded integrally with the inner layer and projecting in a lateral direction inwardly into the aperture to oppose each other and extend in the longitudinal direction of the track in parallel relation to each other, and a pair of conductive members embedded in respective opposing laterally innermost ends of said supporting members simultaneously with said molding of the supporting members so as to be exposed at opposing surfaces of the supporting members and to extend parallel to the longitudinal direction of the track, said inner layer being made of synthetic resin which is harder than that of said outer layer, portions of said inner layer disposed between said conductive members and said cor e plate being thicker in said lateral direction than said outer layer.

4,217,019

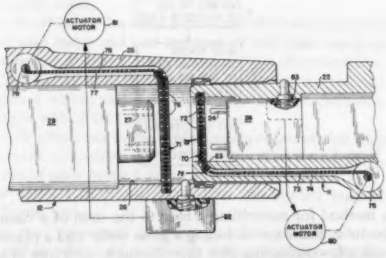
EMI PROTECTED CONNECTOR ASSEMBLY

John K. Cameron, Wheaton, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 743,302, Nov. 19, 1976, abandoned. This application Jan. 25, 1978, Ser. No. 872,187

Int. Cl.[2] H01R *13/44*

U.S. Cl. 339—40 **5 Claims**



1. A connector assembly comprising, in combination:

a receptacle member including a housing having a forward

end and a plug-receiving recess extending rearwardly from said forward end;

first contact means disposed within said plug-receiving recess;

a plug member including a housing having a forward mating end portion externally dimensioned for telescoping insertion into said plug-receiving recess;

second contact means disposed within said plug member for engagement with said first contact means when said forward mating portion of said plug member is inserted into said plug-receiving recess;

closure means disposed on at least one of said housings for enclosing the contact means disposed therewithin, said closure means comprising a shutter assembly which includes a plurality of slat-like shutters mounted edge-to-edge for reciprocation between a closed position across the recess of said one housing and an open position substantially clear of said recess; and

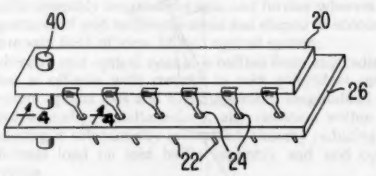
actuator means disposed on said one of said housings and operatively associated with said shutter assembly disposed thereon, said actuator means including an actuating element on said one housing in the path of movement of the other of said housings and engageable thereby to effect operation of said actuating means for automatically opening said shutter assembly in response to a predetermined positioning of said plug mating portion within said plug-receiving recess of said receptacle member.

4,217,020

ELECTRICAL DEVICE CONNECTIONS

Richard W. Holland, Los Gatos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Nov. 13, 1978, Ser. No. 960,510
Int. Cl.³ H01R *13/54, 13/58;* **H05K** *1/12*
U.S. Cl. 339—75 M **10 Claims**



1. In combination with a first and a second electrical device, said first device having a printed circuit pattern thereon with M lead-receiving holes passing through selected portions of said pattern and into said first device, wherein M is a positive integer greater than one, the improvement comprising:

M resilient electrical leads corresponding on a one-to-one basis to said M holes, each lead extending from said second device at least partway into the corresponding hole, the section of each lead within said corresponding hole being smaller in cross-section than said corresponding hole; and

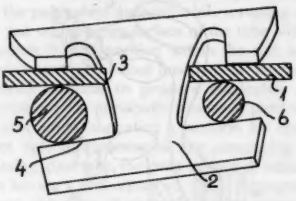
means for rigidly orienting each of said sections to cause a first surface portion of each section to contact a first portion of the surface area forming said corresponding hole and to cause a second surface portion of each section to contact a second portion of the surface area forming said corresponding hole, said first and second portions of the surface area forming said corresponding hole being spaced apart and generally opposed in vector direction to each other; said means for rigidly orienting comprising (1) a first cylindrical portion having a first end surface opposite a second end surface and (2) a second cylindrical portion having a first end surface opposite a second end surface, said cylindrical portions oriented with their longitudinal axes of rotation offset from each other and joined along the first end surfaces, said first cylindrical portion positioned at least partway through a first aperture passing at least partway through said first device and said second cylindrical portion positioned at least partway through a second aperture passing at least partway through said second device.

4,217,021

SCREWLESS WIRE TERMINAL AND SPRING CLIP THEREFOR

Asger Illum, Solroed Strand, Denmark, assignor to Aktieselskabet Laur. Knudsen, Nordisk Elektricitets Selskab, Copenhagen, Denmark

Filed Dec. 21, 1978, Ser. No. 971,906
Int. Cl.² H01R *9/06*
U.S. Cl. 339—95 D **4 Claims**



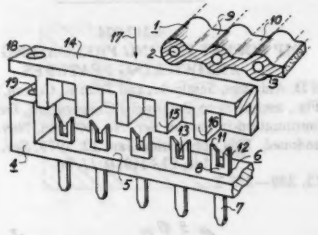
1. A screwless wire terminal for electric wires having a contact strip and a sharp-edged leaf spring clip in a common housing to engage at least one wire which is in contact with the contact strip, wherein the spring clip is in one piece and consists of a U-shaped part and a T-shaped part, the stem of the T-part adjoining the inside arch of the U-part, the U-part and the T-part being disposed on either side of the contact strip by letting the stem of the T-part pass through a section in the contact strip, the sharp edge being provided at the underside of the stroke of the T-part, the housing being provided with abutments for the ends of the spring.

4,217,022

CONNECTOR WITH OPTICAL INSPECTIONS MEANS FOR RIBBON CABLE

Jacques Carré, Suresnes, France, assignor to Socapex, France

Filed Dec. 26, 1978, Ser. No. 972,901
Claims priority, application France, Dec. 30, 1977, 77 39772
Int. Cl.² H01R *9/04*
U.S. Cl. 339—99 R **10 Claims**



1. Connector with optical inspection means for ribbon cable, cable in strip form constituted by a plurality of adjacent conductor wires joined together by a plane common insulating envelope including firstly a block of insulating material provided with a housing for receiving the cable, secondly, a given number of contact elements with insulation pierce type lugs, said lugs projecting into said housing and thirdly, a mobile pusher member ensuring that a force is applied to the cable for inserting the wires into the lugs, wherein the pusher member is provided with optical elements of the "convergent dioptre"

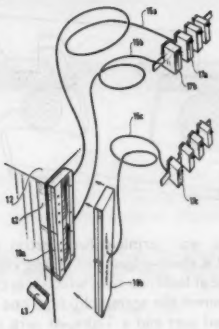
type, disposed opposite insulation pierce type lugs, with their optical axes orientated parallel to the direction of said force of insertion.

4,217,023

DEVICE FOR CONNECTING RACKS TO DISTRIBUTION FRAMES IN TELECOMMUNICATIONS EXCHANGES

Andre Petit, Saulx les Chartreux, and Daniel Jamet, Nozay, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 13, 1978, Ser. No. 951,208
Claims priority, application France, Nov. 4, 1977, 77 33247
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—121 **7 Claims**



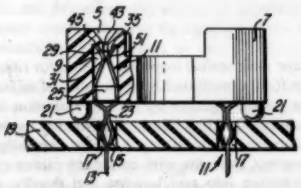
1. A device for connecting racks to distribution frames in telecommunications exchanges, said device including a cable having a connector at each end, the improvement wherein each connector comprises at least one housing component, at least one terminal strip detachably mounted within said at least one housing component, said terminal strip comprising contacts having corresponding positions on two opposed surfaces thereof, said contacts being disposed on each surface in two parallel rows, a flat elongated fixing bar for mounting of said housing component of at least one of said connectors, said housing component bearing two spaced brackets having a gap therebetween, said gap accommodating said flat fixing bar and said brackets bearing aligned elongated slots, and a key insertable through said bracket slots and gripping said flat fixing bar to lock said fixing bar within said gap.

4,217,024

DIP SOCKET HAVING PRELOADING AND ANTIWICKING FEATURES

Lionel D. Aldridge, Seminole, and John K. Cotton, Sunrise, both of Fla., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 849,366, Nov. 7, 1977, abandoned. This application Jan. 12, 1979, Ser. No. 3,057
Int. Cl.[2] H01R *11/06*
U.S. Cl. 339—275 T **17 Claims**



1. An electrical connector assembly comprising:

(a) a plurality of unitary metallic contacts, each of said contacts comprising:

(i) a pair of tail members at least one of which is outwardly bowed;

(ii) an antiwicking stem formed above said tail members, said antiwicking stem comprising parallel facing portions of said tail members;

(iii) a substantially U-shaped main body formed above said antiwicking stem; and

(iv) a pair of inwardly bowed spring members formed above said U-shaped body; and

(b) a unitary contact housing having a plurality of contact cavities, each of said cavities comprising:

(i) guiding means formed in an upper portion of said cavity for guiding leads of an electrical device to be inserted into said cavity;

(ii) camming means formed on said upper portion of said cavity to controllably bias said spring members apart in a preloaded position when said contact is inserted into said cavity; and

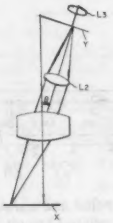
(iii) one or more interior walls of each of said contact cavities tapering inwardly from a lower portion to said upper portion of said cavity to coact with said spring members so as to increase the normal pressure on a terminal pin inserted between said spring members.

4,217,025

STEREOSCOPIC MICROSCOPE

Hiroshi Takenaka, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 30, 1978, Ser. No. 920,794
Claims priority, application Japan, Jul. 25, 1977, 52-88342
Int. Cl.[2] G02B *21/02*
U.S. Cl. 350—33 **4 Claims**



1. A microscope for stereoscopically observing therethrough an object from an oblique direction, comprising:

a first convergent lens group disposed with the optic axis thereof perpendicular to the object plane to collimate the light from each point on the object plane when the focal plane thereof is coincident with the object plane; and

two second convergent lens groups having equivalent optical performances and parallel-disposed so that the principal planes thereof are coincident with each other on the exit side of said first convergent lens group and that the principal planes thereof form a predetermined angle with the principal plane of said first lens group, said predetermined angle substantially defining the oblique direction of observation.

4,217,026

ELLIPTIC CYLINDRICAL BAFFLE ASSEMBLY

Danilo Radovich, Torrance, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

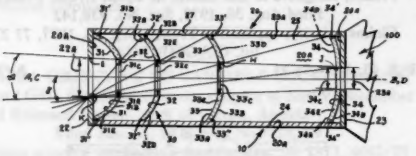
Filed Aug. 25, 1978, Ser. No. 937,018
Int. Cl.[2] G02B *11/04*
U.S. Cl. 350—58 **5 Claims**

1. An elliptic cylindrical baffle assembly having a longitudi-

nal axis, adapted for use with an optical system having an optical axis and a field of view, wherein said longitudinal axis of said baffle assembly and said optical axis of said optical system are coincident, comprising:

a. a hollow, light impervious, completely closeable housing having a reflective internal surface, a first end with a first aperture therein and therethrough, and a second end with a second aperture therein and therethrough, with said first and second apertures centered on, and disposed perpendicular to, said coincident optical system optical axis and baffle assembly longitudinal axis, and with said apertures sized to accommodate said field of view of said optical system;

b. and, a plurality of baffles disposed within said housing, wherein each baffle of said plurality comprises two symmetric halves each of which is a section of a hollow elliptic cylinder having a reflective concave surface, a convex surface, and an aperture interconnecting said concave and



convex surfaces of said section, and wherein each baffle of said plurality is positioned within said housing with its said concave surface facing toward said first end of said housing and with its said convex surface facing toward said second end of said housing, and also wherein said apertures of said baffles are centered on, and are disposed in spaced-apart relationship to each other along and perpendicular to, said coincident optical system optical axis and baffle assembly longitudinal axis, and further wherein said apertures of said baffles are sized and shaped to accommodate said field of view of said optical system;

whereby said optical system is baffled from any radiation that is off-axis with respect to said coincident optical system optical axis and baffle assembly longitudinal axis; and whereby, simultaneously, any radiation within said housing is substantially minimized, thereby reducing any thermal load on said baffle assembly and said optical system.

4,217,027

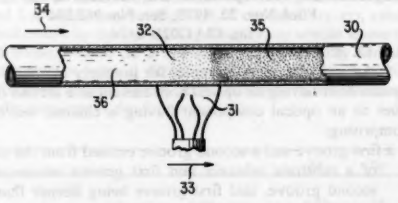
OPTICAL FIBER FABRICATION AND RESULTING PRODUCT

John B. MacChesney, Stirling, and Paul B. O'Connor, Plainfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 444,705, Feb. 22, 1974, abandoned. This application Aug. 29, 1977, Ser. No. 828,617

Int. Cl.[3] C03B *37/07, 37/075*

U.S. Cl. 350—96.3 **26 Claims**



1. Process for fabrication of a glass fiber optical transmission line, comprising a core section and a cladding, wherein the cladding has an index of refraction of a value lower than the maximum index of the core for energy of the wavelength to be transmitted, comprising introducing a moving stream of a vapor mixture including at least one compound glass-forming precursor together with an oxidizing medium into a tube while heating the tube so as to react the said mixture and produce a glassy deposit on the inner surface of the tube, characterized in that heating of tube and contents are by a moving hot zone produced by a correspondingly moving heat source external to the tube in that combustion within the tube is avoided and in that temperature within the hot zone, composition of the vapor mixture, and rate of introduction of the vapor mixture are maintained at values such that at least a part of the reaction takes place within the gaseous mixture at a position spaced from the inner walls of the said tube, thereby producing a suspension of oxidic reaction product particulate material, whereby the particulate material while traveling downstream comes to rest on the inner surface of the tube within a region which extends from a position within the said hot zone, the moving zone serving the dual functions of: nucleation site for homogeneous reaction to produce particulate matter; and consolidation site for previously produced particulate matter.

26. A process of fabricating a preform for drawing into a glass fiber optical transmission line comprising introducing into a rotating glass tube, the inner surface of which is made up of a glass having a first refractive index, a gaseous mixture of oxygen and chlorides of silicon and germanium while a hot zone moving repeatedly along said tube is produced inside said tube by a heat source external to said tube, while maintaining the temperature of the hot zone sufficiently high and introducing said silicon and germanium chlorides at a sufficient rate that the silicon and germanium are converted to an oxidic product at least partly in the form of entrained particulate material which comes to rest on the inner surface of the tube, the said temperature being sufficiently high to effect fusion of said deposited particulate material into a unitary glassy layer of a refractive index higher than said first refractive index.

4,217,028

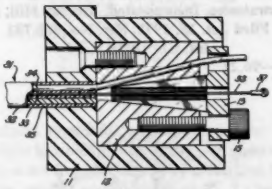
FIBER OPTIC ELECTROMECHANICAL SUBMARINE CABLE TERMINATION

Oswald R. Reh, Bonita, and Hans E. Heinzer, Chula Vista, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,667

Int. Cl.[2] G02B *5/14*

U.S. Cl. 350—96.20 **7 Claims**



1. Apparatus for terminating a cable having at least one optical fiber and a strength member therein, comprising:

a compression block having an axial conical cavity therethrough and at least one optical fiber clearance passage passing through said block outside of but adjacent to said conical cavity;

a pressure cone having an axial bore therethrough, said cone having at least one axial slot through the wall formed by said bore and the conical outside surface of said pressure cone;

and means for securing said pressure cone into said compres-

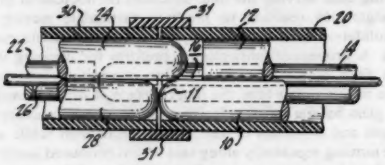
sion block conical cavity and for exerting axial compression therebetween to cause said axial slot to tend to close therby exerting a radially inward gripping force against said strength member inserted into said axial cavity from the narrow end of said compression block axial cavity, said optical fiber passing substantially freely through said passage.

4,217,029

INTERLOCKING PRECISION OPTICAL FIBER CONNECTOR OR SUPPORT

Charles K. Kao, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,249
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **12 Claims**



1. An optical fiber support apparatus, comprising:

first, second and third cylindrical rods of like diameter positioned parallel to an axis and having adjacent circumferential contacting surfaces providing an interstitial space between said rods, said rods terminating at front end surfaces, said first rod having a front end surface extending beyond the front end surfaces of said second and third rods, said second rod having a front end surface configuration defining a reference point, said third rod having a front end surface located a greater distance from said front end surface of the first rod than the distance from the reference point to the front end surface of the first rod; and

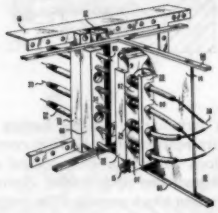
an optical fiber positioned within said interstitial space, with the end of said fiber accurately positioned at a predetermined location with respect to the reference point of said second rod.

4,217,030

FIBEROPTIC-ELECTRONIC CONNECTOR ASSEMBLY

Louis E. Howarth, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 18, 1978, Ser. No. 925,702
Int. Cl.[3] G02B 5/14
U.S. Cl. 350—96.21 **18 Claims**



1. An assembly (10,100) characterized by the ability to make or break simultaneously electrical and optical fiber connections between opto-electronic equipment mounted on a circuit board (14) and opto-electronic equipment mounted on a frame (16) comprising

locking means (12,112) for engaging the board to the frame,

first (18) and second (20) electrical half-connectors mounted, respectively, on the frame and on the board,

first (22,122) and second (24,124) optical fiber half-connectors mounted, respectively, on the frame and on the board,

guide means (26,126) into which the fiber half-connectors are insertable for axially aligning and abutting the fiber half-connectors with one another; and

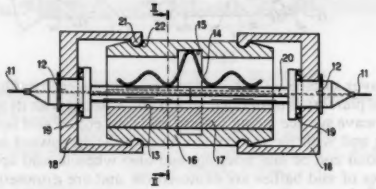
resilient means (28,128) for holding the fiber half-connectors in abutment when the board is engaged with the frame by the locking means.

4,217,031

MECHANICAL DEVICE FOR CONNECTING OPTICAL FIBRES

Georges Mignien, and Christian Millet, both of Meyzieu, France, assignors to Les Cables de Lyon, Lyons, France

Filed Aug. 30, 1978, Ser. No. 938,142
Claims priority, application France, Sep. 14, 1977, 77 27726
Int. Cl.[2] G01B 5/14
U.S. Cl. 350—96.21 **8 Claims**



1. A mechanical device for connecting optical fibres together, said device including, for each junction, two end pieces each constituted by three cylindrical rods, said rods being tangential to each other in pairs and leaving a channel between them for the optical fibre to pass through, each of the groups of three rods being disposed inside a V-shaped groove of a support associated with a circular cylinder, end covers bearing respectively said end pieces, means bearing transversely on two of the three rods for preventing the groups of three rods from moving, the improvement wherein said means for preventing movement include a resiliently deformable blade disposed between said circular cylinder and each group of rods, and said device further including means disposed on said cylinder and said covers for preventing said cylinder from moving longitudinally in relation to said covers, and means disposed between at least one of said end pieces and its cover for resiliently returning the ends of the rods against one another.

4,217,032

END-BUTT OPTICAL FIBER COUPLER

Sang K. Sheem, 7917 Spotswood Dr., Alexandria, Va. 22308

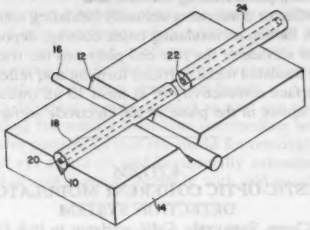
Filed Nov. 22, 1978, Ser. No. 962,854
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **7 Claims**

1. An end-butt optical coupler for precisely coupling a first optical fiber having an optical core therein to a second optical fiber or an optical component having a channel waveguide comprising:

a first groove and a second groove excised from the surface of a substrate wherein said first groove intersects said second groove, said first groove being deeper than said second groove, and said second groove accommodating said first optical fiber; and

an alignment fiber positioned in said first groove so that said alignment fiber is movable in said first groove, contacts

the underside of said first optical fiber and vertically adjusts the first optical fiber for aligning the core of the



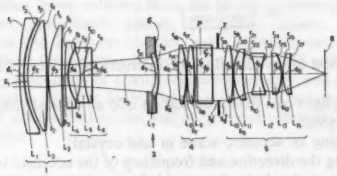
first optical fiber with said second optical fiber or said optical component.

4,217,033

CAMERA OBJECTIVE OF VARIABLE FOCAL LENGTH

Irmgard Göbl, Kitzbühel, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Jun. 23, 1978, Ser. No. 918,399
Claims priority, application Austria, Jun. 30, 1977, 4653/77
Int. Cl.[2] G02B *15/18*
U.S. Cl. 350—184 **2 Claims**



1. In a camera objective of variable focal length including a varifocal foward lens group and a fixed-focus rear lens group centered on a common optical axis, said forward lens group consisting of a substantially axially fixed positive first component, an axially shiftable negative second component, an axially shiftable negative third component and an axially fixed fourth component, said second and third components being displaceable between a wide-angle position of minimum overall focal length and a telephoto position of maximum overall focal length with maintenance of an invarient image plane behind said rear lens group, said third component approaching said fourth component more closely in said telephoto position than in said wide-angle position, the combination of said first, second and third components being of dispersive character,

the improvement wherein said first component consists of lenses L_1, L_2 and L_3, said second component consists of lenses L_4, L_5 and L_6, said third component consists of a lens L_7 and said fourth component consists of lenses L_8 and L_9, said lenses having radii of curvature r_1–r_{17}, axial thicknesses d_1–d_9 and axial spacings s_1–s_7 whose numerical values, based on a numerical value of unity for an intermediate overall focal length, together with their refractive indices n_d and Abbe numbers ν_d are substantially as given in the following table:

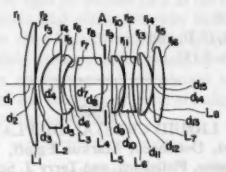
				n_d	ν_d
L_1	$r_1 = +6.6$	$d_1 =$	0.14	1.81	25
	$r_2 = +2.7$				
		$s_1 =$	0.08		
L_2	$r_3 = +2.7$	$d_2 =$	0.50	1.62	60
	$r_4 = -21.7$				
		$s_2 =$	0.01		
L_3	$r_5 = +2.8$	$d_3 =$	0.33	1.67	48
	$r_6 = +18.2$				
		$s_3 =$	0.06 f_{min} 0.64 f_{med} 1.64 f_{max}		
L_4	$r_7 = +7.0$	$d_4 =$	0.08	1.71	54
	$r_8 = +1.1$				
		$s_4 =$	0.32		
L_5	$r_9 = -1.8$	$d_5 =$	0.08	1.62	60
	$r_{10} = +1.8$				
L_6		$d_6 =$	0.21	1.81	25
	$r_{11} = \infty$				
		$s_5 =$	1.53 f_{min} 0.93 f_{med} 0.28 f_{max}		
L_7	$r_{12} = -1.2$	$d_7 =$	0.08	1.74	45
	$r_{13} = -4.6$				
		$s_6 =$	0.50 f_{min} 0.53 f_{med} 0.18 f_{max}		
L_8	$r_{14} = +6.8$	$d_8 =$	0.21	1.62	60
	$r_{15} = -2.9$				
		$s_7 =$	0.01		
L_9	$r_{16} = +4.7$	$d_9 =$	0.17	1.62	60
	$r_{17} = -7.1$				

4,217,034

RETROFOCUS TYPE WIDE ANGLE PHOTOGRAPHIC LENS

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1979, Ser. No. 2,135
Claims priority, application Japan, Jan. 27, 1978, 53-8001
Int. Cl.[2] G02B *13/04*
U.S. Cl. 350—214 **3 Claims**



1. A retrofocus type wide angle photographic lens system comprising eight lens elements grouped into eight components, composed, in order from the object side, of a first lens L_1 being a positive lens, second and third lenses L_2, L_3 being negative meniscus lenses each having a convex surface directed to the object, fourth and fifth lenses L_4, L_5 being positive lenses, a sixth lens L_6 being a negative lens, seventh and eighth lenses L_7 and L_8 being positive lenses, a stop diaphragm disposed between said fourth and fifth lenses L_4 and L_5, and said lens system satisfying the following conditions:

overall focal length F = 100	aperture ratio 1:2.5		viewing angle 85°
radius of curvature	thickness or space	refractive index	Abbe number
$r_1 = 276.34$			

-continued

overall focal length F = 100 radius of curvature	aperture ratio 1:2.5 thickness or space	refractive index	viewing angle 85° Abbe number
L_1 $r_2 = 1748.71$	$d_1 = 13.26$	$n_1 = 1.51633$	$\nu_1 = 64.1$
	$d_2 = 0.41$		
L_2 $r_3 = 93.95$	$d_3 = 7.19$		
$r_4 = 42.38$		$n_2 = 1.51112$	$\nu_2 = 60.5$
	$d_4 = 22.69$		
L_3 $r_5 = 201.92$	$d_5 = 4.90$		
$r_6 = 42.00$		$n_3 = 1.51454$	$\nu_3 = 54.7$
	$d_6 = 14.98$		
L_4 $r_7 = 116.47$	$d_8 = 34.93$		
$r_8 = -208.58$		$n_4 = 1.74077$	$\nu_4 = 27.8$
	$d_8 = 11.87$		
L_5 $r_9 = -1869.36$	$d_9 = 16.04$		
$r_{10} = -66.96$		$n_5 = 1.58913$	$\nu_5 = 61.1$
	$d_{10} = 0.57$		
L_6 $r_{11} = -118.34$	$d_{11} = 10.88$		
$r_{12} = 139.95$		$n_6 = 1.80518$	$\nu_6 = 25.4$
	$d_{12} = 9.64$		
L_7 $r_{13} = -360.80$	$d_{13} = 14.03$		
$r_{14} = -66.60$		$n_7 = 1.51633$	$\nu_7 = 64.1$
	$d_{14} = 0.41$		
L_8 $r_{15} = 402.67$	$d_{15} = 13.08$		
$r_{16} = -157.14$		$n_8 = 1.51633$	$\nu_8 = 64.1$

Backfocus = 156.241 = 1.56 F,
Resultant Focal Length

$$F_{1.2.3} = -67.422 = -\frac{F}{1.48},$$

$$F_{1.2.3.4} = -605.804 = -\frac{F}{0.17},$$

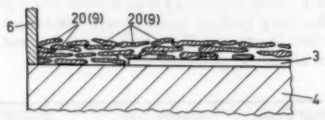
$$F_{1.2.3.4.5.6} = -133.808 = -\frac{F}{0.75},$$

Average Abbe Number for Lenses L_1, L_2 and L_3
$\nu = 59.8$
Overall Length
$\Sigma_d = 174.87 = 1.75$ F, and
Petzval's sum = 0.151.

4,217,035
LIQUID CRYSTAL DISPLAY

Rino Doriguzzi, Dottingen; Markus Egloff, Wettingen; Meinolph Kaufmann, Fislisbach, and Terry J. Scheffer, Forch, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jun. 10, 1977, Ser. No. 805,398
Claims priority, application Switzerland, Jun. 16, 1976, 7652/76; Mar. 16, 1977, 3256/77
Int. Cl.² G02F 1/13
U.S. Cl. 350—338 **6 Claims**



1. In a liquid crystal display including a guest-host liquid crystal layer located between front and rear electrodes of front and rear cell plates, and an integrated reflector located between the front and rear cell plates, the improvement comprising:

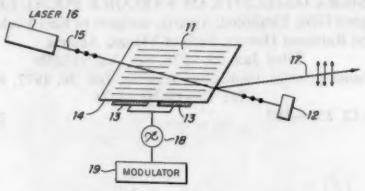
at least said front electrode composed of segments and conduction paths leading thereto, and

said reflector comprising mutually insulating metal particles, each having an insulating oxide coating, deposited on the inner surface of the rear cell plate and the rear electrode, said insulated metal particles forming said reflector having a surface conductivity of at most 10 uS (micro Siemens) per square in the plane of the electrode surface.

4,217,036
ACOUSTIC-OPTIC COHERENT MODULATOR AND DETECTION SYSTEM

I-Cheng Chang, Sunnyvale, Calif., assignor to Itek Corporation, Lexington, Mass.

Filed Apr. 17, 1978, Ser. No. 896,856
Int. Cl.² G02F 1/33
U.S. Cl. 350—358 **8 Claims**



1. A method for modulating the intensity of a cone of light comprising:

a. passing light of a first polarization into an optical birefringent crystal;

b. producing an acoustic wave in said crystal;

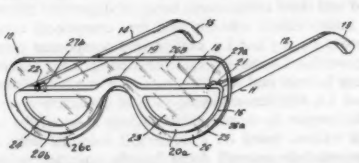
c. selecting the direction and frequency of the acoustic wave to diffract the light from said first polarization into a second polarization for a band of optical frequencies and a distribution of incident light directions; and

d. modulating the intensity of the light diffracted from the first polarization to the second polarization as a periodic function of time with an intensity that is sensitive to the temporal coherence of the incident light.

4,217,037
EYEGLASS SHIELDS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Jul. 26, 1978, Ser. No. 928,299
Int. Cl.² G02C 7/10
U.S. Cl. 351—44 **9 Claims**



1. Eye protecting means for use with half-lens eyeglasses comprising in combination with a pair of half-lens eyeglasses having a frame with horizontally extending left and right frame portions defining the upper rim of said eyeglasses and terminating at about eye level of the wearer and having half-lenses secured within said frame and adapted to be worn by a person requiring corrective vision for reading purposes and shaped to permit such person to look over the top of said frame for viewing objects at a distance,

an eye shield formed of colored light transmitting material,

said eye shield being removably securable to said half-lens eyeglasses,

said eye shield having:

a lower portion covering the lenses of said eyeglasses and,

an upper portion extending above the upper portion of said frame of said eyeglasses when said eye shield is operatively secured to said eyeglasses a sufficient degree to provide protection for the eyes of the wearer when viewing objects at a distance above said frame,

temporary fastening means secured to said eye shield and protruding rearwardly therefrom intermediate said upper and lower portions of said eye shield for removably holding said eye shield on said horizontally extending upper portion of said frame in assembly with said eyeglasses.

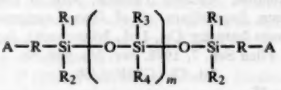
4,217,038

GLASS COATED POLYSILOXANE CONTACT LENS

Eugene C. Letter, Rochester, and Kai C. Su, Webster, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,786
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 R **37 Claims**

1. A sufficient amount of oxygen transportability to meet the requirements of the human cornea, wettable, hydrophilic, fillerless, flexible, hydrolytically stable, biologically inert, transparent, resilient, soft, glass coated polymeric contact lens comprising an outer continuous coating of substantially colorless transparent glass from about 100 to about 8000 Angstroms thick with an index of refraction from about 1.4 to about 1.6, said glass being selected from the group consisting of silicate glasses, borosilicate glasses, phosphate glasses, germanate glasses and mixtures thereof, said substrate having a glass transition temperature below about 0° C., said substrate consisting essentially of a poly(organosiloxane) terminally bonded through a divalent hydrocarbon group to a polymerized activated unsaturated group, said poly(organosiloxane) having the formula:



wherein A is an activated unsaturated group, R is a divalent hydrocarbon radical having from 1 to about 22 carbon atoms, R_1, R_2, R_3, and R_4 can be the same or different and is selected from the group consisting of a monovalent hydrocarbon radical, a halogen substituted monovalent hydrocarbon radical, each having from 1 to 12 carbon atoms and m is 25 or greater.

4,217,039

MICROFICHE VIEWER WITH ROTATABLE BASE

John R. Zellner, Hartford; Eino M. Lehto, Juneau, and Michael V. Polinsky, Iron Ridge, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Oct. 16, 1978, Ser. No. 951,692
Int. Cl.[2] G03B 23/08
U.S. Cl. 353—27 R **5 Claims**

1. A microfiche viewer comprising:

an upper compartment having a hood with base, front, side and rear portions,

a projection screen mounted adjacent to the front portion,

a first mirror mounted adjacent to the rear portion,

a projection lens and second mirror mounted at the base portion,

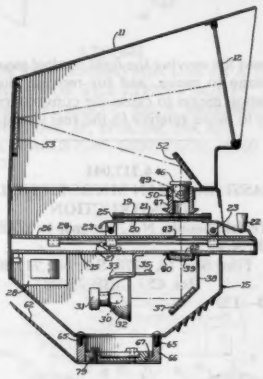
a lower compartment with a removable drawer having a light source and means to project a beam of light from the light source to the projection lens and second mirror,

top and bottom glass flats to retain an image bearing piece of microfilm therebetween, said glass flats interposed between the second mirror mounted in the upper compartment and the third mirror mounted in the lower compartment,

a slide carrier retaining the glass flats such that the top glass flat can be raised for insertion and removal of the microfilm, the slide carrier being movable in a horizontal plane,

the glass flats having a rectangular configuration with one pair of opposite sides of the glass flats longer than the other pair of opposite sides with the shorter sides substantially parallel to the front portion of the microfiche viewer and the longer sides substantially parallel to the side portions of the viewer,

a rotatable base attached to the bottom of the lower compartment comprising a base plate, a circular disk mounted to the base plate, a circular sleeve mounted to the bottom



of the lower compartment and closely receiving the circular disk mounted to the base plate within the sleeve for rotatable movement with respect thereto, a tab on the rotatable disk, and multiple detents within the sleeve whereby the angular rotation of the disk is restrained to a predetermined angle by the tab contacting the detents,

the lamp, lenses, mirrors, and screen defining a light projection path such that different images on the microfilm can be placed in the light projection path as the slide carrier is moved in a horizontal plane, whereby individual images on microfiche may be individually displayed by movements of the slide carrier and the images on the microfiche are placed in an orthogonal orientation such that the longer sides of the rectangular fiche are aligned with the longer sides of the glass flats.

4,217,040

APPARATUS FOR PROJECTING AN IMAGE HAVING A CONVOLUTED FOCAL PLANE

Donald A. Longerbeam, 1553 Lago Apt. 1, San Mateo, Calif. 94403

Filed Apr. 3, 1978, Ser. No. 892,698
Int. Cl.[3] G03B 21/00
U.S. Cl. 353—46 **42 Claims**

1. An apparatus for projecting a selectively distorted real image of an object along a projection path towards a focal surface, comprising;

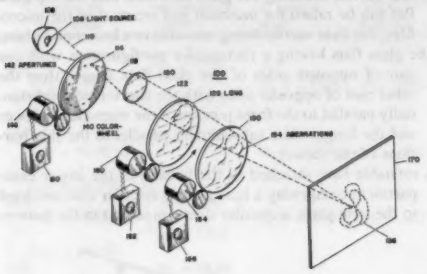
a light source;

light control means forming a light pattern from the light from the light source to define the object of the real image;

projection means for defining the focal surface and for projecting the real image of the object along the projection path;

focal surface modulation means positioned in the projection path and having smooth irregularities for distorting the

projected real image by causing convolutions on the focal surface; and

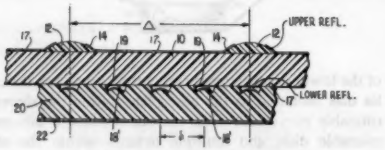


drive means for moving the light control means to cause the real image to move, and for moving the focal surface modulation means to cause the convolutions on the focal surface to move relative to the real image.

4,217,041
CASSEGRAINIAN MICROFICHE LENS CONSTRUCTION

George J. Yevick, Leonia, N.J., assignor to IZON Corporation, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 717,808
Int. Cl.[2] G03B *23/08*
U.S. Cl. 353—120 **2 Claims**



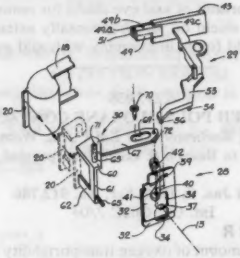
1. A microfiche construction for a reader or for a recorder including, a projection lens plate carrying a plurality of lenses over its surface, a base carrying a photographic emulsion and positioned parallel and contiguous to and relatively indexable with respect to the said lens plate, the improvement comprising, a Cassegrainian reflector for each of the lenses on the projection lens plate, a lower Cassegrainian reflector for each lens carried by said base, the corresponding upper Cassegrainian reflector for each lens defined by an annular, internally mirrored surface around the outermost periphery of each projection lens.

4,217,042
CAMERA FOR DIFFERENT SPEED FILMS

Chan K. Yan, Hong Kong, Hong Kong, assignor to W. Haking Enterprises Ltd., Hong Kong, Hong Kong

Filed Aug. 21, 1978, Ser. No. 937,433
Int. Cl.[2] G03B *7/00, 7/18, 9/04, 17/18*
U.S. Cl. 354—21 **20 Claims**

1. A camera having means for removably receiving a cartridge containing therein a relatively high speed or relatively low speed film and including structural means thereon of a predetermined configuration in accordance with the speed of the film contained therein, means for receiving scene light along a picture-taking axis for exposing the film in the cartridge, an adjustable aperture mechanism in alignment with the picture-taking axis for regulating the amount of scene light exposing the film in the cartridge, an aperture setting manual control member operable independently of the manually operable shutter operating means of the camera, said manual control member being immediately directly and continuously operatively connected with the adjustable aperture mechanism and movable sequentially between sunny, cloudy and flash indicating settings for adjusting the adjustable aperture mechanism to provide immediately respectively relatively small, intermediate and large size apertures in alignment with said picture-taking axis when said high speed film is in the camera, and an automatic control mechanism continuously operatively connected with the adjustable aperture mechanism and including a sensing member cooperating with the structural means on

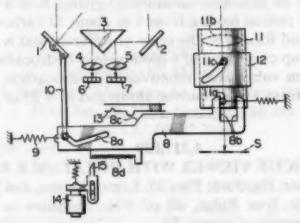


the cartridge received in the camer for adjusting the adjustable aperture mechanism to provide said small and intermediate apertures respectively in alignment with said picture-taking axis when said high speed film is in said camera and said manual control member has said sunny and cloudy indicating settings respectively and to increase the small aperture to the intermediate sized aperture and the intermediate sized aperture to the large aperture when said low speed film is in the camera without changing the settings of the manual control member.

4,217,043
CAMERA HAVING AN AUTOMATIC FOCUS CONTROL APPARATUS

Haruhiko Momose; Masashi Yamada, both of Hachioji, and Yaichi Iijima, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbaski, Japan

Filed Sep. 7, 1978, Ser. No. 940,396
Int. Cl.[2] G03B *3/00*
U.S. Cl. 354—25 **3 Claims**



1. An automatic focus control apparatus for focusing an adjustable lens of a camera, said camera having a pair of photosensitve receiving means, means for forming a pair of auxiliary mirror images of an object or scene to be photographed including a pair of auxiliary optical systems, one having a rotatable mirror and the other having a fixed mirror, means for matching said auxiliary images to each other including an automatic control means operable to move said rotatable mirror successively in opposite directions, and signal processing means adapted to compare the signals provided by the pair of photosensitive receiving means to provide a maximum or minimum output signal during movement of the rotatable mirror in the second direction on the basis of the maximum or minimum comparison values determined during movement of the rotat-

able mirror in the first direction, whereby the movable mirror is stopped as the output signal values are matched, the improvement wherein said automatic control means is operable to move the rotatable mirror in the first direction at a high rate of speed, and in the second direction at a substantially lower rate of speed, and means for releasing a shutter when said movable mirror is stopped.

4,217,044

INDICATING DEVICES FOR CAMERA VIEWFINDERS

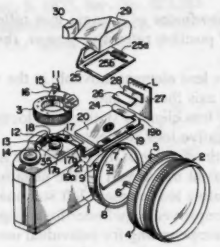
Keiji Yamazaki, Sakai; Takeshi Egawa, Sennan; Yasuo Yamazaki, Kawachinagano, and Hiroshi Ueda, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1977, Ser. No. 851,975

Claims priority, application Japan, Nov. 24, 1976, 51-141572; Nov. 26, 1976, 51-142433

Int. Cl.[3] G03B *17/20*

U.S. Cl. 354—54 **10 Claims**



1. An indicating device for a camera which includes a viewfinder and is selectively settable at least to an automatic diaphragm aperture control mode and to an automatic shutter speed control mode, comprising:

a frame defining the viewfinder optical path and including an opaque bridge arranged within said viewfinder optical path to divide the viewfinder field into an image viewing section and an indicating section, said bridge including a plurality of windows;

a plurality of optical indicating elements located outside of said viewfinder optical path and each associated with a respective window;

first indication signal generating means for generating an electric signal representative of an automatically controlled diaphragm aperture upon selection of the automatic diaphragm aperture control mode;

second indication signal generating means for generating an electric signal representative of an automatically controlled shutter speed upon selection of the automatic shutter speed control mode;

means for selectively energizing one of said optical indicating elements in accordance with the electric signals from the selected one of said first and second indication signal generating means;

a transparent light guide disposed below said frame and traversing said viewfinder optical path and including light reflecting means below said windows for reflecting the light from an energized one of said optical indicating elements towards the corresponding one of said windows;

a transparent scale plate disposed below said light guide and including f-number and shutter speed scales disposed in parallel relationship with one another;

a manually operable member; and

means interconnecting said manually operable member with said scale plate for shifting said scale plate between a first position wherein only a predetermined one of said scales is at a predetermined position in said viewfinder optical path to be observed at the indicating section of the viewfinder field and a second position wherein both said scales are in said viewfinder optical path, said predetermined scale being below said light reflecting means with the other scale being at said predetermined position to be observed in the indicating section of the viewfinder field with said scale plate in the second position, and said light reflecting means being adapted to shield light coming through said predetermined scale with said scale plate in the second position.

4,217,045

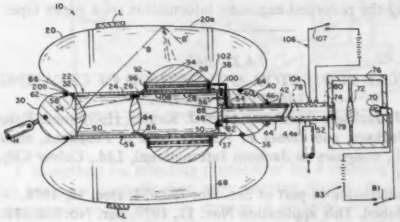
CAPSULE FOR PHOTOGRAPHIC USE IN A WALLED ORGAN OF THE LIVING BODY

Stanley H. Ziskind, 1 Virunga Ct., Apt. B, Baltimore, Md. 21207

Filed Dec. 29, 1978, Ser. No. 127

Int. Cl.[2] A61B *1/06*; G03B *15/02, 29/00*

U.S. Cl. 354—62 **7 Claims**



1. In a capsule for photographic use in a walled organ of the living human body and including a source of illumination, film and photographic focussing means, and means for retrieving the capsule from within the living human body, the improvement comprising: a frame, a balloon having attachment to the frame, means for inflating the balloon to press outward against the walls of said organ, means for photographing with one exposure a 360 degree field of view of the walls of said organ through the balloon, including the frame mounting the film and photographic focussing means within the balloon, a shutter, and said shutter coaxially mounted to the frame between the film and the photographic focussing means.

4,217,046

FILM EXPOSURE DATA RECORDING APPARATUS

Marc D. Weinstein, 135 Eastern Pkwy., Apt. 13E, Brooklyn, N.Y. 11238, and Michael C. Piazza, Jr., Ossining, N.Y., assignors to Marc Weinstein, Brooklyn, N.Y.

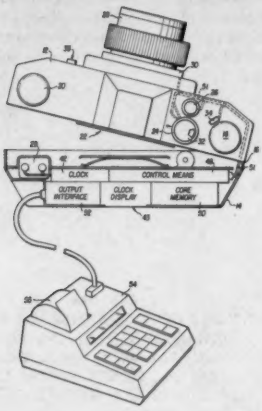
Filed Feb. 23, 1979, Ser. No. 14,477

Int. Cl.[2] G03B *29/00*

U.S. Cl. 354—76 **6 Claims**

1. An apparatus for use in conjunction with a camera comprising signal generating means for generating signals indicative of the various film exposure settings of the camera, core

memory means for recording electronically the previously generated signals with each frame-by-frame of exposure of the



film within the camera and printing means for subsequently printing the recorded exposure information on a paper tape.

4,217,047

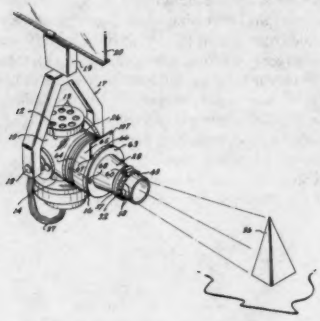
OPTICAL PROJECTOR AND METHOD OF CREATING LIGHTING EFFECTS

Peter J. Jacksen, Pasadena; Arlen J. Kuklin, Hollywood; Peter R. Jacksen, and James F. Vessely, both of Pasadena, all of Calif., assignors to Jacksen International, Ltd., Culver City, Calif.

Continuation-in-part of Ser. No. 750,654, Dec. 15, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,611

Int. Cl.[3] **G03B** *29/00, 21/00*

U.S. Cl. 354—77 **20 Claims**



1. An optical projector comprising means including a source of illumination, means for causing a beam of light to be projected from the projector onto an object to be illuminated, photographic means for producing an image of the object to be illuminated, wherein said photographic means of the projector is constructed to be able to receive in it a self-developing film pack, and means for exposing the film in the self-developing film pack to produce an image, and means including a removable mask constructed to be inserted in the projector at the location in said projector where said image is to be produced so that the beam of light passes through an opening in said mask, said opening conforming to the contour of the object to be illuminated, whereby the mask passes a beam of light having a contour conforming to the contour of the object to be illuminated.

4,217,048

VIEWFINDER CAPABLE OF ADJUSTING DIOPTER

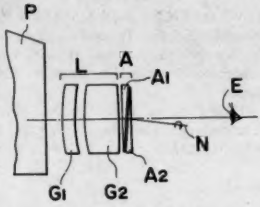
Takeshi Egawa, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 13, 1979, Ser. No. 20,170

Claims priority, application Japan, Mar. 24, 1978, 53/34718

Int. Cl.[2] **G02C** *7/08, 7/14;* **G03B** *13/02*

U.S. Cl. 354—155 **13 Claims**



1. In a viewfinder of a single lens reflex camera having an eyepiece of positive refractive power, the improved eyepiece comprising:

a negative lens element movable in the viewfinder along the optical axis thereof; and

a positive lens element stationarily located at the eye side of the negative lens element,

whereby the diopter of the viewfinder is adjustable by means of the axial movement of the negative lens element with the positive lens element left stationary.

12. In an improved viewfinder for a single lens reflex camera capable of compensating for individual users variances in diopter and abnormality of eye refraction, the improvement comprising:

a negative lens element;

a positive lens element positioned on the eye side of the negative lens element, the negative lens element movable along an optical axis to adjust the diopter of the viewfinder, and

a pair of relatively rotatable prisms capable of providing individual correction of any abnormal refraction of the eye.

4,217,049

SHUTTER BLADE CONTROL DEVICE FOR AUTOMATIC FOCUSING CAMERA

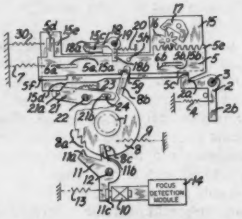
Kiyoshi Kitai; Yukio Morino; Shogo Kato, and Ichiro Nemoto, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,724

Claims priority, application Japan, Nov. 18, 1977, 52/138737

Int. Cl.[2] **G03B** *3/00*

U.S. Cl. 354—195 **4 Claims**



1. A shutter blade control device for an automatic focusing camera capable of automatically focusing the photographic lens by a system actuated by a signal produced by a focus detection module when the distance between the object to be

photographed and the camera is detected, comprising a first actuating member for controlling a focusing member which regulates the position of the photographic lens, a second actuating member for controlling a shutter blade control member, a delay device secured on one of said actuating members and interlocked with the other and operative to perform delaying action with respect to the phase difference between said actuating members, and means controlling the actuating members so that the delay device acts on said first actuating member before the second actuating member is started and after the first actuating member has moved through its operating stroke, the delay device acts on said second actuating member.

4,217,050

PHOTOGRAPHIC CAMERA WITH AN IMAGE OF EXPOSURE CONDITION INDICIA VISIBLE THROUGH A VIEW-FINDER THEREOF

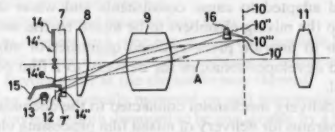
Yasuhisa Sato; Akira Tajima, both of Kawasaki, and Yukiharu Ono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1977, Ser. No. 822,253

Claims priority, application Japan, Aug. 12, 1976, 51-108289

Int. Cl.² G03B *13/06, 17/20*

U.S. Cl. 354—225 **3 Claims**



3. An information display system for a photographic camera comprising:

a photographic system;

a view finder system optically coupled to said photographic system and including a front image plane, an imaging lens means and an ocular in this order;

information indicating means for projecting information beam through said imaging lens means and for forming visible information; and

a prism positioned between said imaging lens and said rear image plane for deflecting said information beam into the visual field.

4,217,051

EXPOSURE TIME SETTING DEVICE FOR SHUTTER OF CAMERA

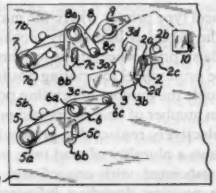
Tadashi Nakagawa, and Ichiro Nemoto, both of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Jun. 20, 1978, Ser. No. 917,197

Claims priority, application Japan, Jun. 23, 1977, 52/74734

Int. Cl.² G03B *9/08, 9/64, 17/38*

U.S. Cl. 354—226 **6 Claims**



1. An exposure time setting device for a shutter of a camera including a control member actuated when the shutter is released for releasing successively an opening member and a closing member, said device comprising: means for setting time exposure ranges including a range wherein said control member is controlled and delayed at the beginning of its movement by a delay mechanism which is actuated by the movement of said control member and is adjusted by the exposure setting member so as to delay the movement of the control member within the exposure time setting range, then releases successively said opening member and said closing member; and a range wherein said control member releases said opening member first, then releases said closing member delayed by said delay mechanism.

4,217,052

METHOD FOR EFFECTING REGISTRATION FOR A COPYING APPARATUS

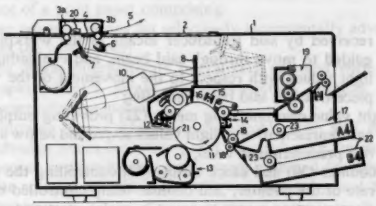
Tatsuo Tani, Tokyo, and Masao Kono, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Feb. 14, 1978, Ser. No. 877,818

Claims priority, application Japan, Feb. 15, 1977, 52/14559; Feb. 16, 1977, 52/15068; Apr. 4, 1977, 52/37567; Apr. 4, 1977, 52/37568

Int. Cl.² G03G *15/00*

U.S. Cl. 355—8 **17 Claims**



1. A method for effecting registration for a copying apparatus having a magnification ratio varying device, in which a photosensitive member in motion is exposed to an optical image of an original by slit exposing to form an electrostatic latent image thereon, by varying the original scanning velocity in accordance with the magnification ratio selected, such method comprising:

providing first detection means for detecting the leading end of the original in a path of travel of the original, said first detection means having its detecting position varied in accordance with the magnification ratio selected; and

delivering a copy sheet simultaneously as or after lapse of a predetermined time following the production of a detection signal by said first detection means;

providing second detection means upstream of said first detection means in said path of travel of the original; and

performing various operations necessary for effecting electrophotographic copying, including feeding of a copy sheet, lighting of a light source, charging of an electrical charging device, etc., by using a detection signal produced by said second detection means.

4,217,053

APPARATUS AND METHOD TO TEST WORKPIECES FOR SIZE, RELATIVE POSITION, MATERIAL INTEGRITY, AND THE LIKE

Jean-Pierre Lavanchy, Apples, and Frieder Heizmann, Monnaz, both of Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1978, Ser. No. 897,037

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717507

Int. Cl.² G01B *11/00, 11/04*

U.S. Cl. 356—372 **16 Claims**

1. Apparatus to test workpieces for size, relative position, material integrity, and the like, comprising

means (1, 2, 3) including a light source (1) generating and projecting a beam of light (5) on the workpiece (4);

light receiving and electrical transducer means (7) located in the path of the beam beyond the workpiece, the workpiece being guided between said beam generating and projecting means and the transducer means to interrupt the beam and block the transmission of light to the transducer means;

and an evaluation circuit (26) connected to said transducer means,

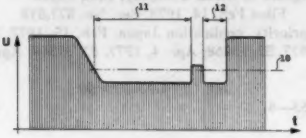
wherein, in accordance with the invention,

the beam generating and projecting means includes

a slit diaphragm (2) located between the source (1) and the transducer (7) and shaped to provide a beam of sheet form for projection unto the workpiece;

and the evaluation circuit (26) includes

response means responding to the instantaneous light values



received by said transducer means as the workpiece is guided to move through said beam, and evaluating said light values with respect to the movement of the workpiece through said beam including

light value discriminating means (22) providing output signals representative of light values above and below at least one predetermined level;

a counter (30) and clock means (33) controlling the count rate of the counter, said counter being controlled by the discriminating means to count in cycles, starting to count when the at least one level is passed and stopping the count when a second predetermined level is passed;

and count direction control means (31) to control the counter to count in a first direction during a first count cycle and in reverse direction during a succeeding count cycle.

4,217,054

FLUID MIXING AND DISPENSING SYSTEM

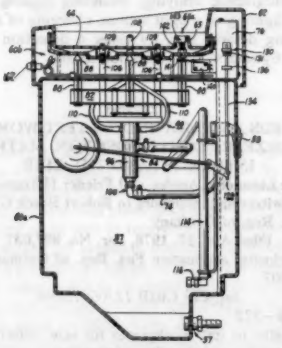
Leonard W. Gacki, White Plains, and Robert E. Daly, Farmingdale, both of N.Y., assignors to Picker Corp., Cleveland, Ohio

Continuation of Ser. No. 609,957, Sep. 3, 1975, Pat. No. 4,103,358. This application Apr. 14, 1978, Ser. No. 896,556

The portion of the term of this patent subsequent to Jun. 6, 1995, has been disclaimed.

Int. Cl.³ B01F *15/02, 15/04*

U.S. Cl. 366—150 **18 Claims**



1. Film processing chemical mixing apparatus comprising:

(a) a chemical mixing assembly including structure defining developer and fixer mixing chambers in which constituents of developer and fixer are mixed, respectively;

(b) a developer supply structure defining a plurality of volumes each for containing a premeasured quantity of one of a group of film developer constituents, the constituents to be mixed in the developer mixing chamber to provide a film developer solution;

(c) a fixer supply structure defining a plurality of volumes each for containing a premeasured quantity of one of a group of film fixer constituents, the constituents to be mixed in the fixer mixing chamber to provide a film fixer solution;

(d) each of the supply structures being positionable selectively in at least one predetermined dispensing orientation with respect to the mixing structure;

(e) fixer and developer constituent dispensing means forming a part of the apparatus and adapted to release developer and fixer constituents from the developer and fixer structures for dispensing into the respective developer and fixer mixing chambers;

(f) coupling mechanism connected to at least one selected structure for connection of the selected structure to a water supply for supplying water for mixture with the constituents;

(g) water flow control means forming a part of the apparatus and adapted to cause constituents and water dispensed into the mixing chambers to be mixed by the water addition to provide predetermined quantities of mixed fixer and developer solutions for delivery to a film processor; and,

(h) a delivery mechanism connected to the chemical mixing apparatus for delivery of mixed film processing chemicals.

4,217,055

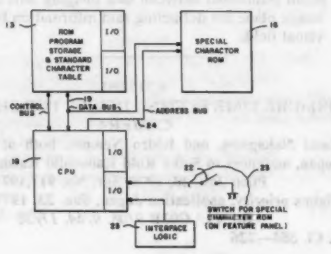
DAISY WHEEL PRINTER WHICH ACCOMMODATES DIFFERENT PRINT WHEEL FONTS

S. David Moon, Los Altos, Calif., assignor to Qume Corporation, San Jose, Calif.

Filed May 30, 1978, Ser. No. 910,954

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 **4 Claims**



1. A daisy wheel type printer where the maximum number of characters on the wheel is limited by mechanical constraints but where the daisy print wheel drive system, which intermittently moves the print wheel to printing positions, is capable of substantially double the number of printing positions compared to said maximum number of characters said printer comprising: a plurality of selectively replaceable print wheels each with a different type font; a plurality of read only memories (ROMs) each uniquely associated with one of said print wheels for storing printing position decoding information for printing selected characters and for storing printing instructions associated with each of such characters at least some of said printing positions which are utilized in one ROM being different from another ROM so that substantially more printing positions than said maximum number is utilized; and switching means for

enabling a selected one of said ROMs which corresponds to the associated print wheel placed in said printer.

4,217,056

TYPE ACTION FOR A POWER-DRIVEN TYPEWRITER

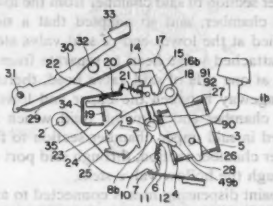
Hirokazu Oka, Kodaira, Japan, assignor to Silver Seiko Ltd., Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,179

Claims priority, application Japan, Mar. 30, 1978, 53/036052; Apr. 28, 1978, 53/057492[U]; May 30, 1978, 53/072335[U]

Int. Cl.[3] B41J *23/08, 25/02*

U.S. Cl. 400—368 7 Claims



1. A type action for a power-driven typewriter comprising

a pivotally mounted type bar,

a pivotally mounted intermediate lever,

a link to connect said type bar to said intermediate lever,

a toothed power roll, constantly rotating at a normal speed and having teeth at the circumference thereof,

a driving pawl pivotally mounted on said intermediate lever and having a tooth disposed to be engageable by a tooth of said power roll to be driven thereby to pivot said intermediate lever and accordingly said type bar in a typing direction to effect typing of the character on said type bar, said driving pawl further having a finger and a sidewardly extending lug formed thereon,

a guide bracket for guiding said driving pawl for motion with and on said intermediate lever,

means for urging said driving pawl, intermediate lever and type bar to respective normal rest positions in which a tooth of said driving pawl is held cleared of a tooth of the power roll,

a spring-urged pivotally mounted key lever depressible to a first position and to a second deeper position, said key lever includes an arm extending upwardly in parallel with and adjacent said trigger lever, and said arm of the key lever has at the upper end thereof a cam portion,

a trigger lever pivotally mounted on said key lever and having a hook and a lug formed thereon,

a spring stretched between said key lever and said trigger lever to bias the latter to a normal position in which said hook of the trigger lever overlies the top of said finger of the driving pawl, and

means for preventing said trigger lever from interfering with said driving pawl when said key lever is in said second position,

wherein said driving pawl is pivoted by said trigger lever in response to depression of said key lever to bring said tooth thereon into the circular path defined by said tooth of the power roll to be subsequently engaged by said power roll,

said trigger lever is yieldably pivoted when it is engaged at said hook thereof by said finger of the driving pawl during return stroke of said pawl to the normal position, and

said cam portion of said arm of said key lever is cleared of said driving pawl lug when said key lever is in the normal rest position or is depressed to the first position and is engaged with said lug of the driving pawl during a return stroke of the latter when said key lever is held depressed to the second position to bring said tooth of said driving pawl into the circular path defined by said teeth of the power roll thereby permitting a repetitive cycle of typing operation to be initiated.

4,217,057

PRINTER PAPER FEED ASSEMBLY INCLUDING MEANS FOR FACILITATING MANUAL PAPER ADVANCE

Osamu Nakamura, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 26, 1978, Ser. No. 872,416

Claims priority, application Japan, Jan. 26, 1977, 52-7415

Int. Cl.[2] B41J *13/02*

U.S. Cl. 400—636 8 Claims

1. A paper feed assembly in a printer for the incremental advance of a print paper comprising:

paper advance means for selectively incrementally advancing the print paper;

drive means intermittently operatively engaged with said paper advance means for incrementally rotating said paper advance means;

positioning means selectively engageable with said paper advance means for rotating said paper advance means into proper position for said engagement with said drive means for rotation of said paper advance means by said drive means;

said paper advance means including roller means and roller gear means mounted on said roller means for intermittent operative engagement by said drive means, said drive means including drive gear means for intermittently operatively engaging said roller gear means;

said roller means including a roller shaft rotatably mounted on said printer, a paper feed roller mounted on said roller shaft and a support roller rotatably mounted on said printer for compressing said print paper between said support roller and said paper feed roller;

said roller gear means being a paper feed gear formed with a plurality of gear teeth equally spaced about the circumference thereof and mounted on said roller shaft and said drive gear means including a paper drive section formed with at least one index tooth for incrementally rotating said paper feed gear; and

said drive gear means further including an auxiliary drive section formed with a plurality of drive teeth about the circumference of said auxiliary drive section and said positioning means including an auxiliary gear means operatively engaged with said auxiliary drive section and formed with reset means for selectively engaging said paper feed gear for rotating said paper feed gear into proper alignment for engagement by said index tooth.

4,217,058

RESERVOIR CARTRIDGE FOR WRITING PENS

Klaus Straszewski, Quickborn; Jochen Rauterberg, Wedel, and Werner Züchner, Hamburg, all of Fed. Rep. of Germany, assignors to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Sep. 22, 1978, Ser. No. 945,046

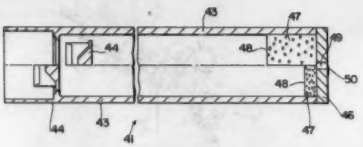
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1978, 2804927

Int. Cl.[3] B43K *5/14*

U.S. Cl. 401—135 2 Claims

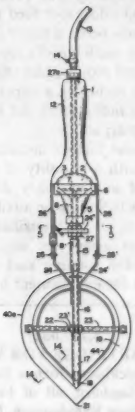
1. In a writing pen of the stylographic type having a tubular writing tip, a pressure compensating chamber and an ink reservoir communicant with said tip, the improvements comprising:

(A) An ink reservoir cartridge detachably secured to said pressure compensating chamber and including:
(i) a longitudinally extending closed wall reservior having a frangible end defining an ink flowing aperture, and a closed end enclosing a supply of ink;
(ii) a rupturable seal closing said reservoir at said ink flowing aperture adjacent said pressure compensating chamber, and
(iii) a resilient portion of said closed wall supported in said reservoir, said resilient portion being axially movable inwardly within said reservoir towards said ink flowing



end to an extent that reduces volume of said reservoir to an equivalent of the volume of ink which has flowed into the pressure compensating chamber, and said resilient portion further including:
(a) a rigid end seal in said outer end, defining an axial opening having a deformable seal affixed thereto, and
(b) a compressible foam member abutting said rigid seal within said reservoir, said foam member being impervious to said ink, such that said foam expands axially into said reservoir, so as to reduce volume, as ink flows from said reservoir into the pressure compensating chamber.

4,217,059
VALVE SYSTEM FOR CONTROL OF PAINT TO SPREADER
James L. Shelton, 257 43rd Ave. NE., St. Petersburg, Fla. 33707
Filed Mar. 9, 1979, Ser. No. 19,316
Int. Cl.[2] B43M *11/02*
U.S. Cl. 401—219 **9 Claims**



1. A paint application system comprising:
(a) a paint source adapted to supply paint at a pressure of at least the force of gravity;
(b) a metering valve system comprising:
(i) a handle having an interior opening extending lengthwise therethrough;
(ii) a supply tube extending through said opening in said handle, said tube being connected to and adapted to have paint from said paint source flow therethrough;
(iii) a valve communicating with the interior of said supply tube and attached to that end of said supply tube opposite from the end connected to said paint source comprising a chamber having an upper section and a lower section and an opening at the lower region of said lower section, a hollow valve stem extending upwardly through said opening having one or more port holes therein, a valve head rigidly attached to the upper end of said valve stem and resting against a surface in said chamber in such a manner to separate and seal the said upper section of said chamber from the lower section of said chamber, and so adapted that a sideway thrust applied at the lower end of said valve stem will cause the attached valve head to separate from the said surface at one side of said valve head, thereby opening a passageway between the upper and lower sections of said chamber and allowing fluid which may be contained in said upper chamber section to flow into said lower chamber section, through said port openings and through the hollow valve stem;
(iv) a paint dispensing means connected to and communicating with the interior of said valve stem and adapted to exert lateral pressure at the connecting end of said valve stem when manual pressure is applied for the application of paint by said paint dispensing means and thereby to actuate the partial unseating of said valve head whereby paint is allowed to flow through said valve to said paint dispensing means.

4,217,060
SYNTHETIC RESIN NIB
Kouzaburo Ikegami, Ibaraki; Yasumasa Morio, and Hitoshi Sakai, both of Osaka, all of Japan, assignors to Sakura Color Products Corporation, Osaka, Japan
Continuation-in-part of Ser. No. 776,374, Mar. 10, 1977, abandoned. This application Oct. 24, 1978, Ser. No. 954,166
Claims priority, application Japan, Mar. 11, 1976, 51-29359
Int. Cl.[2] B43K *1/06*
U.S. Cl. 401—265 **5 Claims**

1. A writing tip comprising a single, synthetic resin stick rod having a body portion and a writing tip portion integrally formed with said body portion, said body and writing tip portions having a plurality of longitudinal slots therethrough, each said slot radiating from the longitudinal axis of said body and tip portions toward the outer circumference thereof, each said slot having a radially outer end forked adjacent said outer circumference and a radially inner end like an arrowhead in cross section adjacent said axis, and each said slot having substantially narrower volumes toward said ends thereof than at the center portion thereof, said slots being such a size that:
$a = 20$ to 80 microns
$2a < b$
wherein a is the slot width at its widest portion, and b is the slot length.

4,217,061
TAPERED KEY COUPLING
P. Frank Eiland, Stamford, and David R. Jacobs, New Canaan, both of Conn., assignors to Abram N. Spanel, Princeton, N.J.
Filed Jun. 30, 1977, Ser. No. 811,956
Int. Cl.[2] F16B *2/06, 7/04;* F16D *1/00, 1/02*
U.S. Cl. 403—313 **10 Claims**

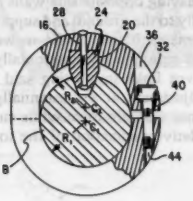
1. A coupling for use particularly in relative inaccessible

areas for precisely aligning and connecting shafts having tapered key seats comprising:

a substantially annular sleeve having a bore of sufficient size to engage said shafts, said sleeve having

(a) at least one radial slot of specified size through to said bore and a partial circumferential slot through to said bore;

(b) a first portion comprising clamp arms as defined by said partial circumferential slot and partially spaced outwardly from said shafts; and



(c) a second portion of substantially equal inner diameter as the diameter of said shafts;

a tapered key extending inwardly of and generally medially of each of said clamp arms so as to extend to said tapered key seats, and

means for independently clamping said clamp arms across said radial slot to said second portion whereby the relationship of (a) the specified size of the radial slot, (b) the space between the first portion and the shafts, and (c) the size of said keys, enables said shafts to be precisely aligned by said keys as they are coupled.

4,217,062

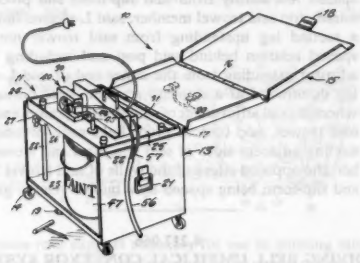
PAINT FEEDING APPARATUS IN COMBINATION WITH A FOUNTAIN TYPE PAINT ROLLER

Peter Trp, 32-77 32nd St., Astoria, N.Y. 11106; Mile Lipovac, 32-58 37th St., Astoria, N.Y. 11103; Rodolfo Ribich, deceased, late of Astoria, N.Y., and by Virginia Ribich, legal representative, 23-32 31st Rd., Astoria, N.Y. 11106

Filed Feb. 27, 1978, Ser. No. 881,585

Int. Cl.³ B05C *1/10*

U.S. Cl. 401—44 **6 Claims**



1. In a paint feeding apparatus combined with a fountain type paint roller, the combination of a paint feeding apparatus and a paint roller, said apparatus including a case on casters a tray inside said case having a pump mechanism mounted thereupon, said mechanism including an electric motor driving a pump, said tray being vertically movable for placement of a can of paint therebelow, wherein said pump including a case having a circular depression, a flexible hose means inside a periphery of said depression opposite ends of said hose means extending through grooves outward of said case, and a rotating arm having rollers at opposite ends squeezing said hose, said arm being driven from said motor wherein said paint roller includes an inner cylinder receiving paint from said hose means and outer sleeve in spaced relation around said inner cylinder, and a lambs wool around an outer side of said sleeve, openings through a cylindrical side of said cylinder for flow of said paint into a space between said cylinder and sleeve, said sleeve being perforated so said paint flows therethrough and soaks said lambs wool, wherein said arm of said pump is longitudinally adjustable by turnbuckle screw means, wherein said hose means comprises a plurality of flexible hoses adjacent each other, one said hose carrying air while a remainder of said hoses each transmit a different paint color supplied from separate paint cans, wherein also said flexible hoses communicate with a piston reciprocally slidable inside said paint roller cylinder, said piston being connected to an end of a stretchable rubber hose which communicates with said hoses said piston also having a plurality of outlets each of which communicates through an accordian expandable hose to one of said paint carrying hoses, said stretchable hose and said accordian hoses being inside said paint roller cylinder.

4,217,063

CENTER SUPPORT FOR BLADE OF EARTHMOVER

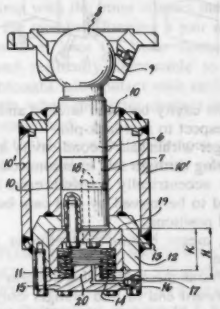
Karl-Heinz Fischer, Laatzen, and Rudolf Perkert, Seelze, both of Fed. Rep. of Germany, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Dec. 19, 1978, Ser. No. 970,899

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758093

Int. Cl.² F16D *3/80*; F16L *17/00*

U.S. Cl. 403—37 **4 Claims**



1. A central support for a tiltable swivelling grading blade on an earthmoving machine including ball and socket joint means for attachment to the rear face of said blade, said ball having a shaft portion interconnecting a piston at its opposite end, housing means including a sleeve for said shaft and mean's defining a chamber coaxially arranged with said sleeve to receive said piston for sliding movement therein, cover means for closing said chamber, spring means interposed between said piston and said cover to normally urge said shaft and ball in a direction towards said blade, said housing means further including a portion at one end of said chamber defining a stop to limit axial travel of said piston in one direction of movement, and whereby said cover limits travel of said piston in an opposite direction of movement.

4,217,064

LATCHING MECHANISM

William F. Hogan, Westville, N.J., assignor to Spectrum X-Ray Corporation, Westville, N.J.

Filed Jun. 29, 1978, Ser. No. 920,345

Int. Cl.² F16C *11/00*; F16D *1/12, 3/00*

U.S. Cl. 403—33 **4 Claims**

1. Latching and indexing means for latching together slidably interfitting first and second members only when said

members are in indexed position and for preventing unlatching except when said members are in indexed position, at least one of said members being tubular, said latching and indexing means comprising:

a. a latch housing secured to the sidewall of said tubular member, said latch housing having first and second cavities interconnected by a channel;

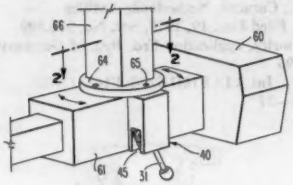
b. a slot in the sidewall of each of said first and second members for receiving a lock-pin to latch said interfitting members together;

c. a lock-pin within said first cavity adapted to project through the wall of said housing and through the slot in the sidewall of said tubular member into the slot in the sidewall of said other member to latch said interfitted members together, or into the path of said other member to prevent interfitting of said members;

d. a spring biasing said lock-pin inwardly toward said first cavity.

e. a cam within said first cavity, said lock-pin being urged inwardly by said biasing spring into operative engagement with the cam surface;

f. a lever arm secured to said cam and projecting from said housing and adapted to move said cam pivotally within



said first cavity between latched and unlatched positions with respect to said lock-pin;

g. a plunger within said second cavity having its inward end projecting through said interconnecting channel and connected eccentrically to said cam, said plunger being adapted to be moved by said cam between outward and inward positions;

h. spring means biasing said plunger toward its outward position;

i. a fixed frame member having a recess therein for receiving the outward end of said plunger only when said tubular member and latch housing are in indexed position relative to said frame member, the construction being such that when said tubular member is removed from indexed position the outward end of said plunger abuts against the surface of said fixed frame and holds said plunger in its inward position and maintains said cam in its latched position relative to said lock-pin, said cam in said latched position preventing inward movement of said lock-pin, thereby maintaining said lock-pin projecting through the sidewall slot of said tubular member, thereby to block interfitting of said members, or to prevent unlatching of said members if already interfitted.

4,217,065

SLIP-FORM CURB AND GUTTER MACHINE

Leo J. Stilwell, Rte. 4, Peavine St., Dowagiac, Mich. 49047

Filed Jun. 2, 1978, Ser. No. 911,800

Int. Cl.[2] E01C *11/28*

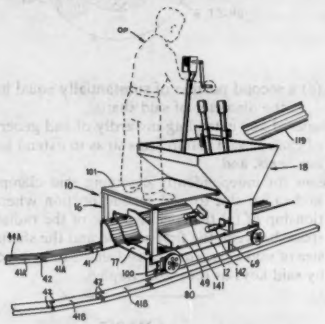
U.S. Cl. 404—98 **15 Claims**

10. A self-supporting machine for slip-forming a concrete ribbon along a preselected path, including a hopper for receiving concrete and a slip-form extending from and communicating with the lower rear portion of said hopper for forming said concrete to the desired cross-sectional shape as the machine advances along said path, said machine further comprising:

wheels fixed at opposite sides of said slip-form to support said slip-form therebetween, said slip-form having opposite side walls extending downward substantially to the ground laterally inboard of said wheels;

fixed, ground supported tracks spaced laterally outboard of said sidewalls of said slip-form for supporting and guiding said wheels along the desired path of said concrete ribbon;

a trowel member disposed at a substantially fixed spacing from the rear edge of said slip-form, said trowel member and slip-form being of substantially rigid sheet material and of inverted, substantially U-shaped cross section, said trowel member following the cross-section of said slip-form and having opposite side walls extending downward substantially to the ground, and support means incorporating, adjacent each side of the trowel, a pair of vertical spaced and substantially horizontally extending top and bottom pivot links supporting said trowel member for vertical adjustment at a substantially constant rearward spacing from said slip-form while substantially maintaining the relative inclination of the top walls of said slip-



form and trowel member, said support means further including a pair of supports on the top wall of said slip-form adjacent the opposite sides thereof, each said support comprising an upstanding post fixed on said slip-form top wall, said top pivot links each being substantially L-shaped having a substantially horizontal first leg with its free end pivoted adjacent the lower end of said post, said L-shaped link having its legs joined at a common point spaced rearwardly from said slip-form and pivotally secured atop said trowel member, said L-shaped link having a second leg upstanding from said trowel member in spaced relation behind said post and including an axial adjustor extending from the upper end of said L-member leg downward at a slope to a pivot point on said post, wherein axial adjustment of said adjustor raises and lowers said trowel, said bottom pivot links each pivotally connecting adjacent sides of said slip-form and trowel member, the opposed edges of the walls of said trowel member and slip-form being spaced by a bubble release gap.

4,217,066

DIVING BELL UMBILICAL CONVEYOR SYSTEM

Albert W. Gunther, P.O. Box 615, Harvey, La. 70059

Filed Mar. 3, 1978, Ser. No. 883,249

Int. Cl.[2] B63C *11/00*

U.S. Cl. 405—185 **7 Claims**

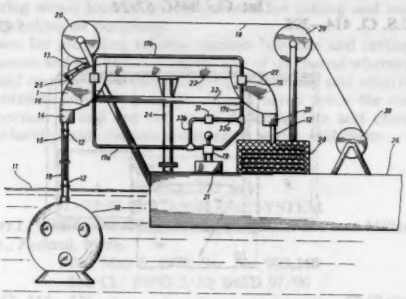
1. A device for handling an umbilical life support cable for a submerged diving bell suspended by a lifting cable from a platform, comprising:

(a) a rotatable umbilical cable conveyor, for guiding the movement of the umbilical cable from the platform to the diving bell as the diving bell is raised and lowered in the water, said conveyor rotating about a pivot point to permit relative motion between the diving bell and the platform;

(b) an umbilical cable gripping means mounted in said con-

veyor, for gripping the umbilical cable without crimping to transmit a lifting force to the umbilical cable; and

(c) a drive means associated with said gripping means, for providing a constant moving force to the umbilical cable



thereby to convey the cable through said conveyor as the diving bell is raised or lowered, and for providing an emergency lifting force to the diving bell to slow the descent of the diving bell should the lifting cable break.

4,217,067

MINE ROOF SUPPORT ASSEMBLY

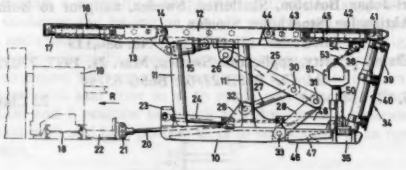
Gunter Lagodka, Lunen; Harry Rosenberg, Ludinghausen; Kunibert Becker, Werl, and Gerd Dunkel, Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,018

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2806982

Int. Cl.[2] E21D *15/44, 19/02, 23/04*

U.S. Cl. 405—296 **18 Claims**



1. A mine roof support assembly for use in winning mineral material from a mineral mining working having a mineral face, the assembly comprising three roof support units positioned side-by-side along the face, and a goaf shield common to the three roof support units, each of the roof support units having a roof shield supported on a floor sill, the goaf shield being adjustable in height so as to extend from the floor to the roof of the working, advance means being provided for advancing the roof support units towards the face, and further advance means being provided for advancing the goaf shield to follow up the advance of the roof support units, the further advance means acting between the goaf shield and the roof support units and being such as to advance the goaf shield by a distance greater than the distance through which the advance means advances the roof support units.

4,217,068

PROTECTING DEVICE OF A CLAMPING MEANS FOR A SHEET-SHAPED MATERIAL WORKING MACHINE

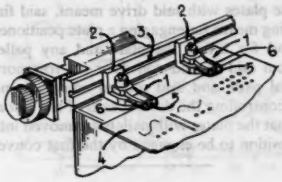
Marcel Fossard, Cheseaux-sur-Lausanne, Switzerland, assignor to Raskin S.A., Switzerland

Filed Aug. 31, 1978, Ser. No. 938,523

Claims priority, application Switzerland, Sep. 14, 1977, 11227/77

Int. Cl.[3] B23Q *5/22;* **B65H** *5/10*

U.S. Cl. 414—20 **3 Claims**



1. A protecting device for stopping the displacement of a machine which works sheet shaped material when the protecting device encounters an obstacle, the machine including clamps which hold the material and which are displaced by the machine, the protection device for each clamp comprising:

outer and inner contact members arranged parallel to each other and disposed on the machine in a loop shape surrounding the clamp with the inner contact member adjacent the clamp, the members forming a pair of normally open contacts with at least the outer contact member being flexible and resiliently deformable to allow the members to be brought into contact with each other and close the contacts when the outer contact member encounters the obstacle; and

stop means coupled to the pair of normally open contacts for stopping the displacement of the machine when the normally open contacts are closed.

4,217,069

DEVICE FOR AUTOMATICALLY RECEIVING SHEETS IN A PILE AND FOR REMOVING A PILE OF SHEETS FROM A SHEET PROCESSING APPARATUS

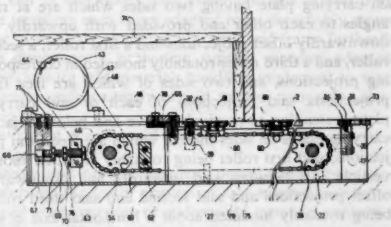
Pierre Lang, Ecublens, Switzerland, assignor to J. Bobst & Fils, S.A., Lausanne, Switzerland

Filed May 4, 1978, Ser. No. 902,805

Claims priority, application Switzerland, May 17, 1977, 006117/77

Int. Cl.[2] B65G *57/03*

U.S. Cl. 414—45 **12 Claims**



1. A device for automatically receiving sheets in a pile at a delivery station of a sheet processing apparatus and removing a completed pile of sheets, said device including first conveyor means for transporting a pallet along a vertical path and including means for lowering the pallet along said vertical path as sheets are deposited at the delivery station and received

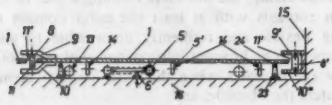
thereon; and a second conveyor means for transporting a pallet in a horizontal path between at least two positions with one of said positions being in the path of the first conveyor and the other position being removed therefrom, said second conveyor means including two side frames supporting a running track therebetween, at least two plates disposed on said track for transporting a respective pallet therealong, drive means for transporting said plates along said track, stop means disposed at each end of said track for bringing each plate to rest at the end of the track, said plates and drive means having releasable means coacting to center the plates on said track and to interconnect the plates with said drive means, said first conveyor means having means for engaging a plate positioned in said one position and for lifting the plate and any pallet supported thereon from said second conveyor for transportation along said vertical path, and said second conveyor means having means for controlling the drive means of the second conveyor means so that the plates with pallets are moved into and out of said one position to be engaged by the first conveyor.

4,217,070

SYSTEM FOR PLACING ITEMS

Erwin Gröger, 32, Starhemberggasse, A-1040 Vienna, Austria

Filed Apr. 26, 1977, Ser. No. 790,986
Claims priority, application Austria, Feb. 8, 1977, 808/77
Int. Cl.² E04H *6/06*
U.S. Cl. 414—239 **4 Claims**



4. A system for placing items, such as motor vehicles in garages, comprising

a floor;

nozzles for discharging compressed air incorporated in said floor;

solenoid valves connected to said nozzles;

a plurality of shiftable carrying plates for supporting the items in a plurality of carrying plate positions arranged in mutually transverse rows throughout the available area of said floor, the number of carrying plates being selected so as to leave at least one carrying plate position unoccupied, each carrying plate having two sides which are at right angles to each other and provided with upwardly and downwardly offset projections and a first roller, a second roller, and a third roller rotatably mounted in corresponding projections, and two sides of which are free from projections, said projections of each of said carrying plates extending respectively above and below adjacent carrying plates on sides thereof which are free from projections, said first roller being rotatably mounted about a verticle axis between said upwardly and downwardly offset projections and said second and said third rollers being rotatably mounted about a horizontal axis in said upwardly and downwardly offset projections, respectively; and

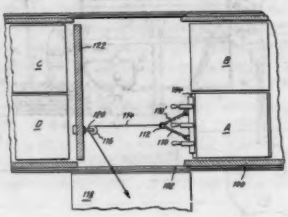
electromagnetic means for shifting each carrying plate from one carrying plate position to an adjacent one comprising low-reluctance slugs carried by said carrying plates, and spaced apart solenoids mounted on said floor for cooperating with said slugs.

4,217,071

SLIP SHEET REPOSITIONING APPARATUS

Thomas W. Ault, Kankakee, Ill., assignor to General Foods Corporation, White Plains, N.Y.

Filed Oct. 20, 1977, Ser. No. 843,764
Int. Cl.² B65G *67/24*
U.S. Cl. 414—395 **5 Claims**



1. The combination of a railroad box car having a bulkhead therein and a hand portable slip sheet transfer device associated therewith, said device comprising:

a pair of elongated solid metal gripping members having moderate cambers about their opposed gripping surfaces wherein at least one member of said elongated gripping members has a hard rubber gripping surface,

a plurality of independently actuatable toggle pliers having jaws operatively engaged with said gripping members and having the ability to move said gripping members between an open and a locked position relative to a slip sheet positioned therebetween, said gripping members having adjustment means movable in a direction perpendicular to the face of the sheet to vary the gripping pressure between said members and said slip sheet positioned therebetween,

means for applying a pulling force for pulling said gripping members transversely to their elongation

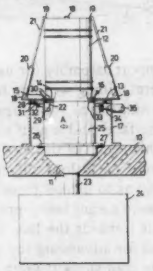
and means mounted on said bulkhead for changing the direction of said pulling force.

4,217,072

METHOD AND APPARATUS FOR OPENING BARRELS AND FOR EMPTYING SAID BARRELS OF THEIR CONTENTS WITHOUT POLLUTING THE ENVIRONMENT

Kari-Johan Boström, Skelleftea, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Mar. 13, 1978, Ser. No. 886,113
Claims priority, application Sweden, Mar. 21, 1977, 7703213
Int. Cl.² B65B *21/02*; B65G *65/34*
U.S. Cl. 414—412 **22 Claims**



22. An apparatus for removing the contents of a barrel, comprising:

a chute for receiving the contents of said barrel;

means for vertically supporting a barrel on one end over said chute;

means for sealing said one end with said chute whereby the contents of said barrel are maintained within said chute when opened;

cutting means located at said one end for cutting said one end along its periphery;

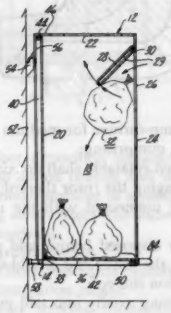
means for providing relative rotation between said cutting means and said barrel along the axis of said barrel whereby said one end is cut along its periphery during said relative rotation until the contents of said barrel force the cut portion of said one end to be deflected into said chute whereby said contents are released within said chute.

4,217,073

MATERIAL HANDLING SYSTEM

Robert L. Propst, Ann Arbor, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed May 5, 1978, Ser. No. 903,248
Int. Cl.[2] B65G 3/10; B65D 91/00
U.S. Cl. 414—421 **10 Claims**



1. A container comprising an upright hollow body having side walls, a front wall, a rear wall, and a top wall, means on said body providing an inlet opening at the upper end thereof, and a discharge door movably mounted on the lower end of said body for movement between closed and open positions, said door in the closed position thereof forming a bottom wall for said body and in the open position thereof allowing material in said body to discharge therefrom through the bottom end thereof, a generally L-shape support frame for supporting said container and having an upright portion and a base portion, and coacting means on said container and on said upright portion for pivotally supporting said container on said frame for movement between a position in which said base portion is engaged with said door so as to retain said door in a closed position and a position in which said door is in a clearance relation with said base portion so as to be movable to an open position.

4,217,074

SLIP SHEET LIFT TRUCK

Paul J. Leasor, St. Marys; Gerald S. Pulskamp, and Harold A. Stammen, both of Bremen, Ohio, assignors to Crown Controls Corporation, New Bremen, Ohio

Filed Jun. 9, 1978, Ser. No. 914,622
Int. Cl.[2] B60P 1/34
U.S. Cl. 414—642 **8 Claims**

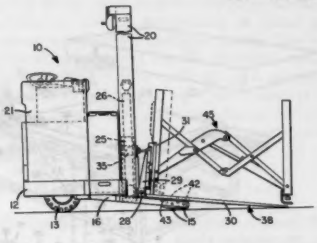
1. A slip sheet lift truck comprising:

(a) a frame,

(b) said frame including ground engaging outriggers each extending forwardly and sloping downwardly from the front of the lift truck in a fixed position with respect to said frame and the ground,

(c) a platen,

(d) tilting means securing said platen to said frame for tilting said platen upwardly and downwardly with respect to said frame between a sloped ground engaging loading position and a raised carrying position, said forwardly and downwardly sloping outriggers thereby providing clearance for said platen when tilted downwardly to said sloped ground engaging position, and



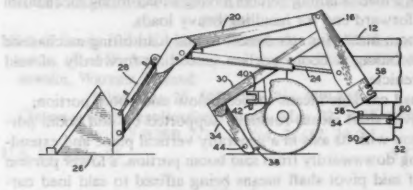
(e) a push-pull mechanism carried on the lift truck with said platen for pulling and pushing a load onto and off said platen, said push-pull mechanism tilting and moving with said platen when tilted by said tilting means.

4,217,075

LOADER DEVICE AND METHOD OF MOUNTING

Eldon M. Frank, R.R. 1, P.O. Box 23, Lake View, Iowa 51450

Filed Feb. 2, 1978, Ser. No. 874,615
Int. Cl.[2] E02F 3/70
U.S. Cl. 414—686 **18 Claims**



1. A method for mounting a loader device on a tractor wherein said tractor has mounting brackets including a pair of side mounting brackets, and wherein said loader device includes a frame having a pair of spaced-apart side frame members each having the rearward end rigidly attached to upright frame members intermediate the upper and lower portions thereof, a boom having a rearward end pivotally connected to said upper portions of said upright frame members, and a materials handling implement pivotally connected to the forward end of said boom, said lower portions of said upright frame members each being adapted to be detachably mounted to one of said side mounting brackets, said frame further having a downwardly projecting support member adapted to cooperate with said materials handling implement to support said loader independently of said tractor comprising the following steps:

positioning the forward end of said tractor adjacent said support member;

rotating said upright members downwardly about an axis through the lower portion of said support member until said lower portions of said upright members contacts said side mounting brackets;

moving said materials handling implement with respect to said support member while said upright members are rotated downwardly;

rotating said side frame members about an axis through the lower portions of said upright members until said frame is in a substantially horizontal position; and

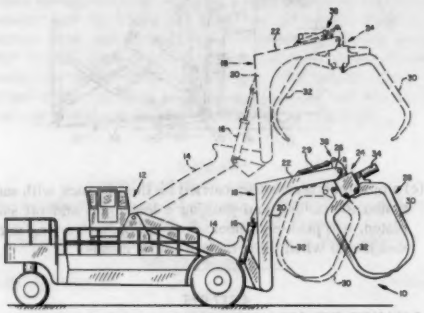
detachably securing said loader device on said tractor.

4,217,076

LOAD HANDLING VEHICLE WITH ROTATING GRAPPLE MECHANISM

James J. Robnett, and William H. Herold, both of Portland, Oreg., assignors to Raygo Wagner, Inc., Portland, Oreg.

Filed Sep. 13, 1978, Ser. No. 942,061
Int. Cl.[2] B66C *23/00*
U.S. Cl. 414—735 13 Claims



1. In a load handling vehicle having a load-lifting mechanism at its forward end for handling heavy loads,

a boom means for attachment to said load-lifting mechanism including a boom portion extending forwardly of said vehicle;

a load carriage means spaced below said boom portion;

a pivot shaft means rotatably supported by said boom portion with its axis in a generally vertical plane and extending downwardly from said boom portion, a lower portion of said pivot shaft means being affixed to said load carriage means to suspend and rotatably support said load carriage means below said boom portion;

and fluid cylinder operated rotation means carried by said boom portion and connected to said pivot shaft means for pivoting said pivot shaft means in opposite directions about the axis thereof and thereby pivoting said load carriage means and any load carried thereby to the same extent;

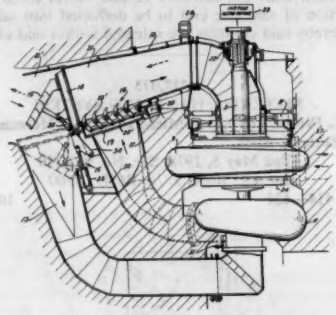
said fluid cylinder operated rotation means including a first floating lever rotatably connected to said pivot shaft means, a second floating lever rotatably connected to said pivot shaft means and to said first lever so that said first and second levers are rotatable together about said pivot shaft means, a first fluid cylinder pivotally connected at one end to said boom portion and at its other end to said first floating lever for rotating said first floating lever and thereby said second floating lever about said pivot shaft means in opposite directions, a third fixed lever affixed to said pivot shaft means for rotation therewith, and a second fluid cylinder connected pivotally at one end to said second floating lever and at its other end to said fixed lever for pivoting said fixed lever in opposite directions, whereby operation of said first cylinder causes rotation of said floating and fixed levers and thus said pivot shaft means in one direction about the axis of said pivot shaft means and operation of said second cylinder causes rotation of said fixed lever relative to said second floating lever and thus additional rotation of said shaft means in the same said one direction.

4,217,077

TWO-STAGE/SINGLE-STAGE REVERSIBLE PUMP-TURBINE WITH SUPPLYING PUMP

Anton Brcar, Ljubljana, Yugoslavia, assignor to Titovi Zavodi Litostroj Ljubljana n.sol.o., Ljubljana, Yugoslavia

Filed Feb. 16, 1978, Ser. No. 878,434
Claims priority, application Yugoslavia, Feb. 21, 1977, 475/77
Int. Cl.[2] F01D *1/30, 15/10*
U.S. Cl. 417—407 2 Claims



1. A reversible pump-turbine for medium and high pressure hydroelectric plants, comprising:

a vertically mounted rotatable shaft coaxial with said pump-turbine and engaging the rotor thereof;

a motor-generator connected with the upper end of said shaft;

a supplying pump disposed below said pump-turbine and engageable with the lower end of said shaft on one direction of the rotation thereof;

a first conduit opening axially into said pump-turbine;

a second conduit opening tangentially into said pump-turbine;

a third conduit communicating between the outlet of said supplying pump and said first conduit;

a fourth conduit communicating between the inlet of said supplying pump and said first conduit;

closure means operable between a fourth conduit blocking position when said pump-turbine is driving said motor-generator and a first conduit blocking position when said pump-turbine and said supplying pump are being driven by said motor-generator for directing a water stream into said fourth conduit;

a sluice in said third conduit operable between a closed position when said pump-turbine is being driven by said motor-generator and an open position when said pump-turbine and said supply pump are being driven by said motor-generator;

guide means at said inlet of said supplying pump for imparting a rotation to an incoming water stream, said pump-turbine being of the scroll type having a diminishing cross section with a plurality of vanes mounted on said rotor in one direction and at least one vane guide for controlling the flow between said rotor and said scroll, said supplying pump being of the scroll type having a diminishing cross section and oriented 180° opposite to said scroll of said pump-turbine and a plurality of vanes arranged on the rotor thereof in a direction opposite to said vanes of said pump-turbine, said supplying pump being engaged by said shaft when said shaft is being driven by said motor-generator;

a valve provided at the highest point of said first conduit for bleeding air trapped therein at the start of a pumping mode of the system, a portion of said first conduit being coaxial with said shaft and said shaft is mounted in a collar bearing at the point of emergence from said first conduit and in a guide bearing provided in said pump-turbine, said

water stream being directed by a plurality of ribs provided on said closure means, said closure means being a pivotable flap operable by a linkage contained in a recess adjacent said fourth conduit; and

said sluice is of the Venetian-blind type having a plurality of pivotable blades operable by a drive contained in a recess adjacent said third conduit.

4,217,078

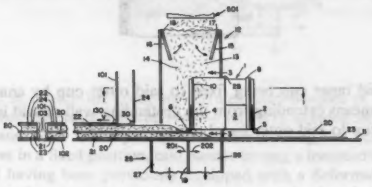
APPARATUS FOR FORMING A CONTINUOUS REINFORCED FIBROUS WEB

Kenneth B. Buell, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 810,559, Jun. 27, 1977, Pat. No. 4,141,772. This application Nov. 15, 1978, Ser. No. 960,883

Int. Cl.² B29B *5/00*

U.S. Cl. 425—81.1 **9 Claims**



1. An in-line fiber deposition apparatus for continuously vacuum forming an airlaid fibrous fluff web adjacent the uppermost and lowermost surfaces of a substantially planar reinforcing ply having substantially the same width as said web, said apparatus comprising:

(a) fiber disintegration means;

(b) a continuous fiber deposition chamber interconnected to said fiber disintegration means;

(c) a continuously moving foraminous support member passing through said deposition chamber in a plane substantially perpendicular to the direction of fiber flow;

(d) suction means located adjacent the surface of said foraminous support member opposite said fiber disintegration means;

(e) means for introducing said reinforcing ply to said deposition chamber in a first direction identical to that of said foraminous support member while said ply is oriented in a first plane such that its width is substantially parallel to the direction of fiber flow within said chamber to facilitate vacuum forming the portion of said airlaid fibrous fluff web adjacent the lowermost surface of said reinforcing ply on said foraminous support member;

(f) guide means extending perpendicular to said first direction of travel within said fiber deposition chamber for abruptly reorienting said reinforcing ply to a second plane perpendicular to said first plane while restoring said ply to said first direction of travel to facilitate vacuum forming the portion of said airlaid fibrous fluff web adjacent the uppermost surface of said reinforcing ply; and

(g) means for removing said ply and said airlaid web portions from said fiber deposition chamber.

4,217,079

APPARATUS FOR THE PRODUCTION OF PLASTICS ARTICLES

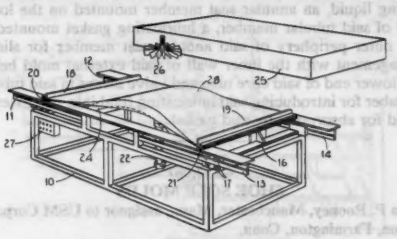
George L. Smith, Ridgeway, Binton, Near Stratford-Upon-Avon, Warwickshire, and Leslie J. Smith, 37 Lingfield Rd., Eastwick Park, Evesham, Worcestershire, both of England

Division of Ser. No. 748,532, Feb. 8, 1976. This application Sep. 15, 1978, Ser. No. 942,771

Int. Cl.² B29C *17/02*

U.S. Cl. 425—89 **9 Claims**

1. A machine for producing a shaped article from thermoplastic sheet material comprising a frame, a pair of trolleys mounted on said frame to freely move in a horizontal plane torward and away from each other, clamp means fixedly mounted on each of said trolleys for holding by opposite ends the plastic sheet to be worked in a plane substantially parallel to the horizontal plane of movement of the trolleys, and free of said frame, a former located below the horizontal plane of movement, means for raising and lowering said former across



the horizontal plane of movement of the trolleys to engage and thereby to deform the sheet clamped between said trolleys, said trolleys being freely movable inwardly on such engagement to carry said sheet during deformation, and heating means arranged to heat the sheet evenly at least over a portion or portions thereof to be deformed by the former, and cooling means for cooling the sheet after deformaton.

4,217,080

MACHINE FOR MOLDING PIPE-TYPE ELEMENTS SUCH AS STEEL FABRIC REINFORCED CONCRETE PIPES

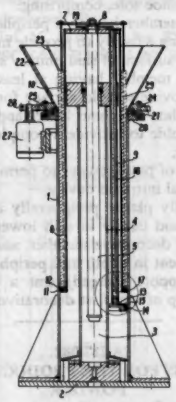
Michal Sandowicz; Krzysztof Wiaderek, and Waldemar Hamann, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Filed May 25, 1978, Ser. No. 909,415

Claims priority, application Poland, May 30, 1977, 198517

Int. Cl.² B28B *7/38, 21/14, 21/22, 21/56*

U.S. Cl. 425—95 **5 Claims**



1. A machine for molding tubular elements such as steel fabric reinforced concrete pipe comprising in combination, a tubular external mold, means for supporting said external mold in an upstanding position, a core tube disposed concentrically within said external mold with the outer surface of said core tube in spaced-apart relationship with the inner wall of said external mold to define an annular mold cavity, separable stop means mounted on the lower end of said core tube for sliding

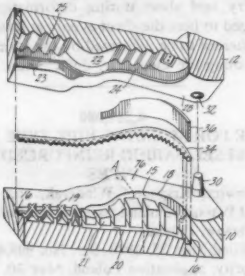
engagement with the inner surface of said external mold, means for moving said core tube reciprocally within said external mold, a funnel rotatably mounted on the upper end of said external mold to form an extension of said external mold, means for rotating said funnel, at least one elongated tubular member mounted to said means for moving said core tube to extend within said core tube such that the lower end thereof is located below the lower end of said core tube and stop means, said tubular member having an inner cavity containing a lubricating liquid, an annular seat member mounted on the lower end of said tubular member, a lubricating gasket mounted on the outer periphery of said annular seat member for sliding engagement with the inner wall of said external mold below the lower end of said core tube and valve means in said tubular member for introducing said lubricating fluid into said external mold for absorption by said gasket.

4,217,081

SHOE SOLE MOLDS

John P. Rooney, Manchester, Mass., assignor to USM Corporation, Farmington, Conn.

Filed May 22, 1979, Ser. No. 41,425
Int. Cl.[2] B29C *1/00, 1/14;* B29H *7/08*
U.S. Cl. 425—129 S **6 Claims**



1. A mold apparatus for casting an article of plastic material such as a unitary shoe sole, comprising:

a lower mold member having a peripheral wall and lower surface defining a cavity to provide mold surfaces for the sides and top surface of said unitary shoe sole;

an upper mold member having at least an upper surface therein to provide a mold surface for a tread portion of said unitary shoe sole, said lower and upper mold members juxtaposable to provide a complete mold cavity for said shoe sole;

an arrangement of passageways to permit the injection of a plastic material into said cavity;

a lower generally planar peripherally arranged surface is provided in said cavity in said lower mold member to receive a first decorative member, and a peripheral wall surface sufficient in depth and peripheral contour to receive and support thereadjacent a second decorative member on top of said first decorative member.

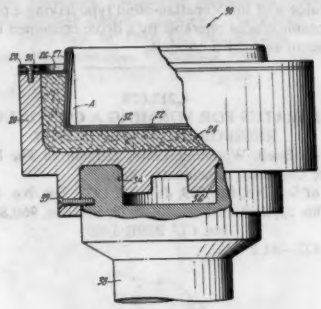
4,217,082

SPIN CUP MEANS FOR THE PRODUCTION OF METAL POWDER

Romeo G. Bourdeau, Tequesta, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1977, Ser. No. 862,897
Int. Cl.[2] B29C *23/00*
U.S. Cl. 425—8 **15 Claims**

1. An atomizer rotor for receiving a flow of molten metal and flinging it radially outward to produce solid metal particles comprising an outer metal cup, means for rotating said metal cup, an inner metal cup having an upstanding wall and bottom, means for positioning said inner metal cup in said outer metal cup while spacing it from said outer metal cup around its upstanding wall and bottom, the upper edge of said inner metal cup being positioned above the upper edge of said outer metal



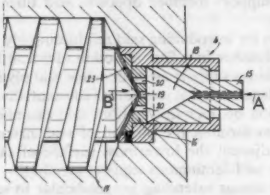
cup, said inner cup being fixed to said outer cup by annular flange means extending from the upstanding wall of said inner metal cup to said outer metal cup.

4,217,083

EXTRUSION HEAD

Jean H. J. Machuque, Asnieres, France, assignor to Diepal Corporation, Rhone, France

Filed Mar. 13, 1978, Ser. No. 885,556
Claims priority, application France, Mar. 16, 1977, 77 08596
Int. Cl.[2] A21C *3/04*
U.S. Cl. 425—198 **9 Claims**



1. In an extruder wherein a dough mixture is supplied under pressure from an extrusion screw rotating about its central longitudinal axis through an extrusion head to a nozzle, said screw having a conically shaped tip, the improvement comprising:

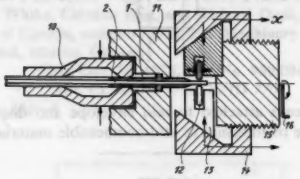
a diffuser grid mounted within said extrusion head and between said tip and the nozzle, wherein there is provided a pressure equalizing chamber between said grid and said nozzle, said grid having a substantially planar surface facing said nozzle and an inwardly conical surface facing said tip, the conical surface of the grid having a cone angle substantially the same as said tip and defining a compression chamber between said tip and said grid, and wherein said grid consists of two series of parallel channels, all channels located at the same radial distance from the longitudinal axis of the screw and arranged symmetrically relative to a median plane of the nozzle along opposite arcs of a single circle centered on the longitudinal axis of the screw for imparting a uniform linear speed to the strands of dough passing through the respective channels.

4,217,084

DEVICE FOR CRIMPING FERRULES ONTO BUNDLES OF OPTICAL FIBRES

Andre Jacques; Christian Malsot; Chantal Moronvalle, and Edith Bertau, all of Suresnes, France, assignors to Socapex, Suresnes, France

Filed Nov. 28, 1978, Ser. No. 964,794
Claims priority, application France, Nov. 28, 1977, 77 35775
Int. Cl.[3] A21C 3/06
U.S. Cl. 425—321 4 Claims



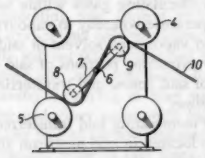
1. A device for crimping ferrules onto bundles of optical fibres comprising N fibres, $N=1+3n(n-1)$, in being an integer greater than 2, comprising means for holding the bundle of fibres in a fixed position, said bundle having a longitudinal axis and having been previously equipped with a deformable ferrule to be crimped, crimping means comprising knurled rollers distributed on a circle situated in a plane orthogonal to the longitudinal axis of the bundle and centred at a fixed point on this axis and a mechanical system for controlling the knurled rollers, this mechanical system being such that the knurled rollers are rolled along said circle on said ferrule and, at the same time, the diameter of said circle is reduced as said rollers are moved towards said point the axis of the bundle and act on the cylindrical outer wall of the ferrule until a minimum diameter of the bundle, which corresponds to a hexagonal arrangement of the fibres in the bundle, is reached.

4,217,085

ARRANGEMENT FOR THE PROCESSING OF A MOVING MATERIAL WEB

Per-Allan Ljungberg, and Lennart Nilsson, both of Lund, Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Filed Apr. 18, 1979, Ser. No. 31,331
Claims priority, application Sweden, Apr. 25, 1978, 7804705
Int. Cl.[2] B29C 17/08
U.S. Cl. 425—335 10 Claims



1. An arrangement for the processing of a moving material web comprising:

(a) a supporting frame having a central axle;

(b) a cradle swivelly mounted on said central axle;

(c) counter-rollers rotatably mounted on said cradle; and

(d) at least two processing rollers arranged parallel with the central axle,

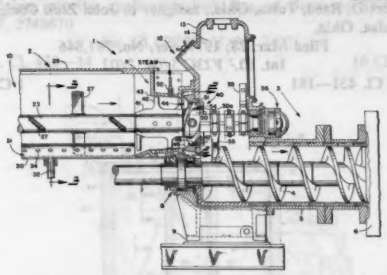
said arrangement further being constructed and arranged such that the cradle can be swivelled between an inactive position wherein the moving material web is out of contact with the counter-rollers and the processing rollers and an active position wherein the moving material web is contacted with the counter-rollers and at least some of the processing rollers.

4,217,086

EXTRUDER WITH SEALING DIE FOR ABRASIVE MATERIAL

Miles W. Christian, Plymouth, Ohio, assignor to Plymouth Locomotive Works, Inc., Plymouth, Ohio

Filed Feb. 3, 1978, Ser. No. 874,883
Int. Cl.[3] A01J 21/02
U.S. Cl. 425—376 R 23 Claims



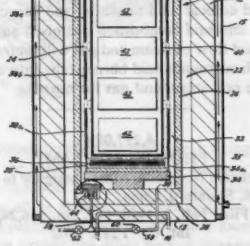
1. An extruder, comprising auger means for forcing extrusion material through an extruder die to form an extrusion, and input means for delivering extrusion material to said auger means, including de-airing means for removing air from said extrusion material prior to delivery to said auger means and seal means upstream of said de-airing means for sealing the extrusion material inlet to the latter, said seal means including a flighted sealing core to push extrusion material into said de-airing means, and a sealing die, said sealing core being positioned within an open part of said sealing die to push extrusion material therethrough, and said sealing core and sealing die each including a major wall portion generally parallel with the travel direction of extrusion material through said sealing die.

4,217,087

ISOSTATIC APPARATUS FOR TREATING ARTICLES WITH HEAT AND PRESSURE

Arnold G. Bowles, Jenkintown, Pa., assignor to Pressure Technology, Inc., Meadowbrook, Pa.

Filed Jul. 16, 1979, Ser. No. 57,859
Int. Cl.[2] B29C 3/00; B30B 11/00; B22F 3/14
U.S. Cl. 425—78 9 Claims



1. A hot isostatic press comprising a vessel associated with cooling means around its outer surface and forming an interior chamber, heat insulating mantle means dividing said chamber into an inner chamber portion and an outer chamber portion, said chamber portions being in communication with each other and said inner chamber portion being operatively associated with heating means whereby gas in said inner chamber portion

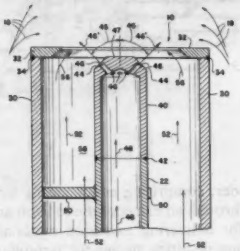
is relatively hot during operation, and whereby gas in said outer chamber portion is cooler, valve means between said inner and outer chamber portion for preventing or allowing the flow of gas through said chamber portions.

4,217,088

BURNER FOR VERY LOW PRESSURE GASES

Robert D. Reed, Tulsa, Okla., assignor to John Zink Company, Tulsa, Okla.

Filed Mar. 28, 1977, Ser. No. 781,846
Int. Cl.[2] F23C *5/08, 7/02*
U.S. Cl. 431—181 **1 Claim**



1. Apparatus for burning very low pressure gas which, by its pressure and velocity, is unable to aspirate air sufficient for combustion in combination with a combustion chamber, having an opening through one wall, and a source of very low pressure gas, comprising a burner axially positioned into said opening, said burner comprising;

(a) a burner tube into which the low pressure gas is supplied, the tube of selected diameter and length, and having an annular inwardly extending flange at the flame end of selected radial width, said flange beveled around its inside upstream edge, said burner tube closed at the other end,

(b) a tube positioned axially inside said burner tube, said tube passing through said closed end into said burner tube and terminating with a closed end below the top of said annular flange said end machined with its outer surface conical,

(c) a plurality of orifices or ports drilled into and perpendicular to said conical surface of said tube,

(d) means supplying steam, at pressure of at least 5 psig, into said tube, whereby high velocity jets of steam issuing from said orifices will flow in the form of a conical wall through the annular opening in said wall into said combustion chamber,

whereby said low pressure gas will turbulently mix and flow with said conical wall of steam, and thence through said opening into said combustion chamber, and

whereby said flow of steam and gas will aspirate combustion air which surrounds said burner tube into said opening to mix with said steam and gas for burning.

4,217,089

PHOTOFLASH LAMP

Bernard Kopelman, Magnolia, Mass., assignor to GTE Products Corporation, Stamford, Conn.

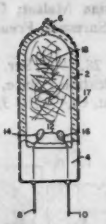
Filed Feb. 3, 1975, Ser. No. 546,242
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—362 **6 Claims**

1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a combustion supporting gas in said envelope;

a quantity of combustible material located within said envelope comprising a plurality of filaments which have been formed by release from the periphery of a rotating heat-extracting disk in contact with a melt of said combustible material, each of said filaments having notches along the length thereof; and



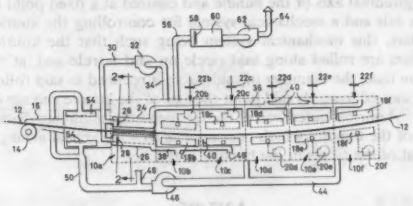
ignition means attached to said envelope and disposed in operative relationship to said combustible material.

4,217,090

OVEN HEATING SYSTEM

Alan S. Whike, Caledon East, and Richard Dusil, Mississauga, both of Canada, assignors to B & K Machinery International Limited, Malton, Canada

Filed Aug. 22, 1978, Ser. No. 935,855
Int. Cl.[2] F27B *9/28*
U.S. Cl. 432—8 **13 Claims**



10. The method of curing a coating on a strip workpiece carrying said coating and said coating containing a vapourizable solvent which is oxidizable to provide at least part of the heat requirement for said curing process, said process comprising the steps of;

passing said strip in sequence through an oven containing a plurality of sequential zones, comprising an upstream zone, and sequential downstream zones;

continuously circulating gases within said zones at an elevated temperature whereby to vapourize said solvent and entrain said vapourized solvent in said oven gases;

continuously extracting portions of said oven gases from at least one of said zones, and transferring the same to said upstream zone;

continuously incinerating said transferred gases in incineration means located in said upstream zone;

passing said incinerated gases, at an elevated temperature, through radiant header means located adjacent the path of said strip workpiece, whereby to radiate at least some of the heat from said incinerated gases towards said workpiece;

continuously transferring said incinerated gases from said header means to at least one of said downstream zones, and discharging the same in said zone;

continuously circulating a portion of oven gases from one of said zones, and,

continuously circulating said portion of gases through circulation ducts arranged to direct such gases along either edge of said strip, and ejecting same through openings between said radiant header means and an adjacent surface of said workpiece, said gases passing through the

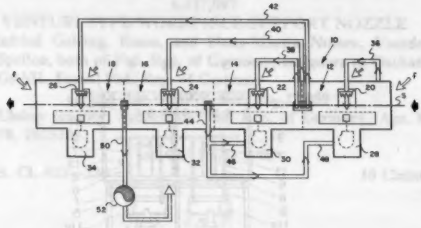
spacing therebetween, transversely relative to the axis of said strip.

4,217,091

OVEN PROCESS WITH SOLVENT FREE EXHAUST

Alan S. Whike, Caledon East, and Richard Dusil, Mississauga, both of Canada, assignors to B & K Machinery International Limited, Malton, Canada

Filed Oct. 10, 1978, Ser. No. 950,084
Int. Cl.[2] F27B *9/28;* F27D *7/04*
U.S. Cl. 432—8 7 Claims



1. A method of operating a strip curing oven for curing a solvent based coating on a strip passing therethrough, and comprising;

passing said strip continuously through sequential oven zones;

continuously circulating hot gases separately in respective said zones to vapourize solvents in said coating and entrain them in such gases within respective said zones and cure said coatings; said solvents being released in high volume in at least one zone of high solvent release, and being released in low volume in at least one zone of low solvent release;

continuously incinerating some of said gases in said zones to oxidize solvent vapours therein and returning same directly to respective said zones;

continuously extracting some solvent rich gases without incineration from said high solvent release zone and distributing them to incinerators at other said zones;

continuously incinerating said solvent rich gases in said other zones to oxidize said solvent vapours and discharging substantially solvent free incinerated gases at an elevated temperature into said other zones for mixture with zone gases thereby supplying at least part of the heat requirement for said other zones with high temperature gases substantially free of solvent vapours;

continuously extracting some of said gases from some said other zones and introducing them into said high solvent release zone to replace a portion of said solvent rich gases transferred therefrom;

continuously replacing a further portion of the volume of said solvent rich gas transfer by migration of zone gases within said oven from a zone of low solvent release to a zone of high solvent release thereby preventing downstream migration of high solvent gases into zones of low solvent release;

continuously introducing fresh air to maintain efficient incineration of said solvent vapours, and,

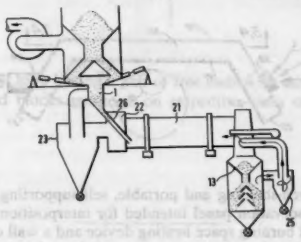
continuously extracting some of said solvent free gases from said zone of low solvent release and exhausting them directly to atmosphere without incineration.

4,217,092

METHOD AND DEVICE FOR SINTERING MATERIAL OF DIFFERENT GRANULAR SIZE

Wolfram Quittkat, Gauting, and Dieter Frank, München-Obermenzing, both of Fed. Rep. of Germany, assignors to Babcock Krauss-Maffei Industrieanalgen GmbH, Mucich, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 956,140
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748670
Int. Cl.[3] F27B *15/00, 7/02*
U.S. Cl. 432—14 10 Claims



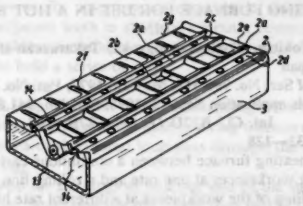
9. A kiln assembly comprising a rotary shaft kiln having an inlet and to which is coupled a shaft preheater having a housing defining a gas entry shaft and an outlet end to which is coupled a shaft cooler, said kiln having a rotary kiln charging head coupled to said gas entry shaft via a gas discharge line, and at least one cyclone incorporated into said discharge line for collecting dust.

4,217,093

FIXING ARRANGEMENT IN ELECTROSTATIC COPYING MACHINE

Fritz Steinlehner, and Dieter Weidlich, both of Münich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Nov. 28, 1978, Ser. No. 964,800
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753625
Int. Cl.[2] G03G *13/20*
U.S. Cl. 432—59 16 Claims



1. In an electrostatic copying machine, a fixing arrangement serving to fix the toner image on copy paper, comprising, in combination, transport means for transporting copy paper bearing on one of its faces a toner image to be fixed along a predetermined path; and a heating structure located along said path and facing against the other face of the copy paper, said heating structure having a major surface juxtaposed with the copy paper, said major surface being generally flat and including a pair of upwardly projecting elongated ribs contacting the copy paper to achieve a minimal direct physical contact with the copy paper and provide a confined hot-air air volume within the area between said ribs and the other face of copy paper, said major surface is provided with transverse ribs

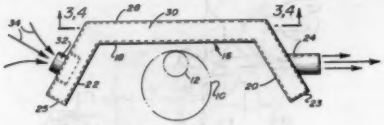
extending at least mainly in the direction traverse to the direction of said elongated ribs to form individual recessed fields each bounded on all sides by said ribs and confining hot air volumes when closed off by the other face of copy-paper.

4,217,094

COMBINATION SAFETY AND HEAT CONSERVATION PANEL

Helen E. Crowley, 2649 Mountain Rd., Bath, Pa. 18014

Filed Dec. 21, 1978, Ser. No. 972,001
Int. Cl.³ F27D *7/00, 17/00*
U.S. Cl. 432—65 **8 Claims**



1. A free-standing and portable, self-supporting safety and heat conservation panel intended for interposition between a fossil fuel burning space heating device and a wall comprising:

(a) a plurality of continuous parallelpipedal, free standing panel sections joined in angular relationship to each other and partially encircling, but separate, exterior, and spaced apart from, a room space heating device, said sections forming a single portable panel having an inner wall proximate said heating device, a spaced-apart outer wall remote from said heating device, a top spanning the two walls, a bottom and ends, thereby closing the space between said walls to define a single, contiguous hollow interior therebetween, said inner wall being constructed of a heat conducting material and said outer wall being constructed of an insulating material;

(b) inlet means to permit air at ambient temperature to enter said hollow interior;

(c) guide means for permitting heated air entering said panel to be conducted through said panel interior; and,

(d) exit means, remote from said inlet means, directionally oriented to permit heated air to leave said hollow interior in a predetermined direction to heat areas distant from said panel and heater.

4,217,095

REHEATING FURNACE FOR USE IN A HOT ROLLING LINE

Tetsuya Tokitsu, 21-10, Izumigaoka, Takarazuka-shi, Hyogo-ken, Japan

Division of Ser. No. 799,312, May 23, 1977, Pat. No. 4,170,815. This application Sep. 12, 1978, Ser. No. 941,637
Int. Cl.² B22D *11/128;* **F27B** *9/02*
U.S. Cl. 432—128 **2 Claims**

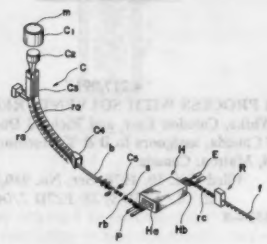
1. A reheating furnace between a continuous casting means for casting workpieces at one rate and a rolling line for carrying out rolling of the workpieces at a different rate higher than the rate of casting workpieces, said reheating furnace comprising:

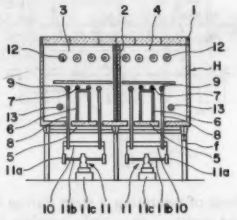
a housing extending in the direction of transportation of the workpieces from the continuous casting means to the rolling line, said housing having a partition wall extending in the direction of transportation dividing said housing into first and second independent heating sections extending longitudinally of said housing, each section having an inlet at the end adjacent said continuous casting means for receiving workpieces from said continuous casting means and an outlet at the end adjacent said rolling line for discharge of said workpieces into said rolling line,

a walking beam means in each section of said housing for transporting workpieces along the corresponding section;

a driving means for each walking beam means for driving the respective walking beam means independently of each other at a first speed corresponding to the one rate and a second speed corresponding to the different rate; and

burner means in each section individually operable for heating the sections separately, whereby one of said sections





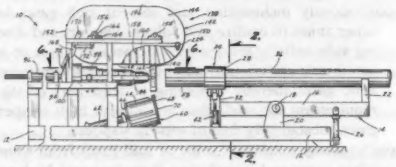
can be charged with workpieces which are being produced at said one rate and can start heating the workpieces, while the other of said sections is heating the workpieces to the desired rolling temperature and maintaining them at that temperature and feeding them to the rolling line at said different rate.

4,217,096

APPARATUS FOR HEATING PLASTIC PIPE

Fay A. Hayes, 242 NW. 12th Ave., Boca Raton, Fla. 33432, and Leonard L. Hayes, 1906-10th Ave., Lewiston, Id. 83501

Filed Mar. 19, 1979, Ser. No. 21,585
Int. Cl.² F24J *3/00*
U.S. Cl. 432—225 **9 Claims**



1. An apparatus for heating one end portion of a plastic pipe comprising,

a heating bell having a generally continuous sidewall and an open forward end for receiving said pipe end portion therethrough,

said sidewall including inner and outer generally cylindrical wall portions, each having at least one opening adjacent the forward end thereof for delivery of heating liquid therethrough, said wall portions being arranged one within the other such that a generally cylindrical space is formed therebetween, said cylindrical space being of a diameter for receiving said pipe end portion,

means for removably inserting said pipe end portion through

said open forward end to a position within said cylindrical space, and

fluid conduit means on said heating bell arranged for directing a flow of heating liquid over the inserted pipe end portion,

said conduit means including inner and outer supply conduits each having one end in communication with a source of preheated liquid and an opposite end in communication with respective openings at the forward ends of said inner and outer wall portions for directing heating liquid onto the respective inside and outside surfaces of said pipe end portion respectively.

4,217,097

VENTURI-TYPE WORKPIECE-SUPPORT NOZZLE

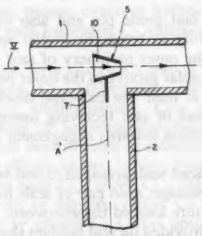
Winfried Gelsing, Essen, and Hans-Martin Nolzen, Voerde-Spellen, both of Fed. Rep. of Germany, assignors to Oschatz GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 6, 1979, Ser. No. 27,859

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 2815323

Int. Cl.[2] F27D *3/02*

U.S. Cl. 432—234 **10 Claims**



1. In a furnace workpiece-support system having at least one horizontal workpiece-support tube through which a fluid coolant is circulated and at least one vertical tube connected at its upper end at a joint to said horizontal tube and having a blind lower end, the improvement comprising:

a tubular pressure-alteration body in said joint and having an intake mouth directed upstream and an outlet mouth directed downstream and of different flow cross section from said intake mouth; and

a flow-diversion element extending downwardly from said pressure-alteration body into said vertical tube.

4,217,098

DEVICE FOR LIMITING THE PENETRATION OF DENTAL ROOT CANAL INSTRUMENTS

Marcel Garnier, Besancon, France, assignor to Micro-Mega S.A., Besancon, France

Continuation of Ser. No. 588,717, Jun. 20, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 784,447

Claims priority, application France, Jul. 30, 1974, 74 26455

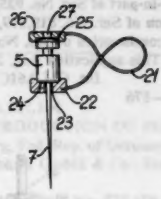
Int. Cl.[2] A61C *3/00*

U.S. Cl. 433—147 **6 Claims**

5. A holder, for a dental root canal instrument, consisting of:

a first block having first and second opposed major surfaces and having a bore extending through said block between said opposed major surfaces;

a second block; and



a resilient loop having a pair of free ends with said first and second blocks mounted on respective ones of the free ends.

4,217,099

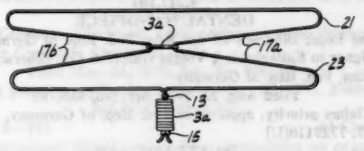
DEVICE FOR INSERTING ELASTOMERIC SEPARATION RINGS BETWEEN TEETH

Charles B. Thornton, 4555 Whisper Lake Dr. No. 2, Florissant, Mo. 63033

Filed Apr. 9, 1979, Ser. No. 28,245

Int. Cl.[2] A61C *7/00*

U.S. Cl. 433—148 **7 Claims**



1. A device for inserting an elastomeric separation ring between adjacent teeth in a person's mouth, comprising:

a ring holder comprising a stem adapted to extend through and to hold a series of rings;

a series of rings on said stem;

a closed loop of strand material extending from one end of said stem and adapted to receive a ring thereon so that two segments of the closed loop pass through the opening in the ring;

a first stop for the rings at said one end of the stem, having a lateral dimension slightly larger than that of the opening in each of the rings, so that said first stop may impede but not completely block movement of the rings therepast; and

a second stop for the rings at the other end of the stem, having a lateral dimension substantially larger than the opening in each of the rings so that said second stop may completely block movement of the rings therepast;

whereby when a ring is received on said loop of strand material, said closed loop of strand material may be formed into two smaller loops one on each side of said ring, which when pulled in a direction radially of the ring stretch said ring to effect elastic deformation thereof to a narrower thickness facilitating the insertion of the ring between adjacent teeth in the patient's mouth.

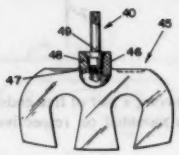
4,217,100
ANGULATION HEAD FOR DENTAL IMPLANT AND BENDING TOOL FOR SAME

Alfred E. Edelman, 1 MacArthur Blvd., Westmont, N.J. 08108

Continuation-in-part of Ser. No. 925,764, Jul. 18, 1978, which is a continuation of Ser. No. 819,119, Jul. 26, 1977, abandoned, which is a continuation of Ser. No. 559,226, Mar. 17, 1975, abandoned. This application Aug. 28, 1978, Ser. No. 937,585

Int. Cl.[2] A61C *8/00*

U.S. Cl. 433—176 **11 Claims**



1. A dental implant device comprising a dental implant for implantation in a jaw bone and adapted to be covered over with the skin covering the jaw bone while the jaw bone is healing about the implant, and an angulation head adapted to be removably secured to said dental implant, said dental implant having a body portion and a hollow cylindrical neck integral with said body portion, said neck having a flat end opposite said body portion, and an interiorly threaded bore extending axially inwardly from said flat end, said angulation head having an intermediate circular flange for seating on the flat end of said neck a stem depending from said flange, external threads on at least a portion of said stem for threaded engagement in the threaded bore of said neck, and an elongated bendable head portion integrally connected to said flange opposite said stem.

4,217,101
DENTAL HANDPIECE

Hans Logé, Biberach an der Riss, Fed. Rep. of Germany, assignor to Kaltenbach & Voight GmbH & Co., Biberach an der Riss, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 935,799

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 7729110[U]

Int. Cl.[2] A61C *1/08*

U.S. Cl. 433—126 **14 Claims**

1. A dental handpiece comprising:

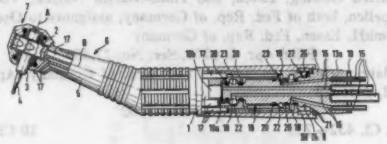
a holding sleeve by which the handpiece may be manually manipulated;

a tool-drive unit mounted at one end of the said sleeve and adapted for operation by a fluid pressure medium;

a connecting member releasably connected to said sleeve at the opposite end thereof, said connecting member and said sleeve being relatively rotatable and said connecting member being adapted to be coupled releasably and non-rotatably with a fluid pressure supply hose, said releasable engaged position of said connecting member and said holding sleeve is a detent position;

first fluid pressure lines provided in said holding sleeve and second fluid pressure lines provided in said connecting member, said first and second lines being in communication with each other and serving to convey fluid pressure media between said supply hose and said drive unit and/or associated consumers of fluid pressure media;

a guide pin provided on said connecting member and a receiving passage provided in said holding sleeve in order axially to receive said guide pin and to connect together said holding sleeve and said connecting member, said second fluid pressure lines extending generally longitudi-



nally through said guide pin and also extending transversely outwardly to respective outlet apertures axially spaced along the outer periphery of said guide pin, and including an annular groove in the outer periphery of said guide pin and at least one ball-type detent housed in a recess in the wall of said receiving passage and spring-biased in a direction towards engagement in said annular groove;

pairs of axially spaced seals arranged to seal said guide pin in said receiving passage, each pair of seals having a respective outlet aperture located therebetween;

abutment means provided on said holding sleeve and on said connecting member and engageable, upon insertion of said guide pin in said receiving passage, in order to define a releasable, engaged position of said connecting member relative to said holding sleeve;

and annular ducts provided in the wall of said receiving passage and registering one with each of said outlet apertures when said connecting member is in said engaged position, each duct communicating with a respective one of said first fluid pressure lines.

4,217,102

POLYAMIDES DYED WITH RUBINE DISAZO ACID DYES AND PROCESS THEREFORE

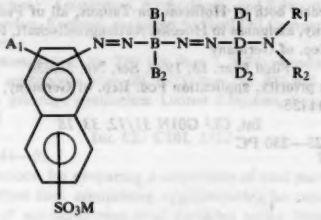
Hans A. Stingl, Toms River, N.J., assignor to Toms River Chemical Company, Toms River, N.J.

Division of Ser. No. 864,034, Dec. 23, 1977. This application Mar. 26, 1979, Ser. No. 23,972

Int. Cl.[2] D06P *3/24*

U.S. Cl. 8—662 10 Claims

1. A process of dyeing polyamide fibers with a dyestuff of the formula



wherein

M is hydrogen, lithium, sodium, potassium or ammonium;

B and D are each independently 1,4-phenylene or 1,4-naphthylene;

A_1 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl, trifluoromethyl, nitro, chloro, bromo, cyano or hydroxy;

B_1 and B_2 are each hydrogen, C_{1-3} alkoxy, C_{1-3} alkyl, chloro or bromo;

D_1 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl or chloro;

D_2 is hydrogen, C_{1-4} alkoxy, C_{1-4} alkyl, chloro, bromo, fluoro, C_{1-5} alkanoylamino, C_{1-5} alkylsulfonylamino, benzoylamino, or benzenesulfonylamino, the acylamino groups either unsubstituted or substituted with 1 to 3 C_{1-2} alkyl, C_{1-2} alkoxy, chloro, bromo, cyano, or hydroxy; and

R_1 and R_2 are each C_{1-6} alkyl, C_{1-6} chloro or bromoalkyl, C_{2-6} hydroxy or dihydroxyalkyl, C_{2-6} alkoxyalkyl, C_{1-6} cyanoalkyl or phenyl-C_{1-2} alkyl unsubstituted or substituted on the phenyl with 1 to 3 of C_{1-2} alkyl, C_{1-2} alkoxy, chloro, bromo, cyano, or hydroxy

from a neutral to weakly acidic aqueous dyebath.

4,217,103

DYESTUFF FORMULATIONS CONTAINING SALTS OF DIARYL ETHER SULFONIC ACIDS

Karlheinz Wolf; Hans-Heinz Mölls; Reinhard Nebeling; Hans-Werner Petroll, all of Leverkusen; Reinhold Hörnle, Cologne; Richard Schwaebel, Leverkusen, and Vaclav Kaspar, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

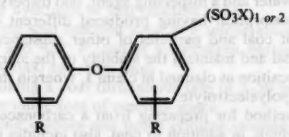
Filed Sep. 22, 1978, Ser. No. 945,001

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1977, 2743066

Int. Cl.[2] D06P *1/12*; C09B *27/00*; D06P *1/39, 1/62*

U.S. Cl. 8—66 4 Claims

1. A dry dyestuff formulation comprising an anionic, water-soluble dyestuff or developable dyestuff and a salt of a diaryl ether-sulphonic acid of the formula



wherein

R is hydrogen or methyl,

X is lithium, potassium, sodium or $N(R')_4$, and

R' is hydrogen, C_1–C_4-alkyl or $(CH_2—CH_2—O)_nH$ wherein n is 1, 2 or 3.

4,217,104

PROCESS FOR THE PRODUCTION OF FUR SKINS

Hans-Dieter Graf, Eurasburg, Fed. Rep. of Germany, assignor to Dr. Th. Bohme, Chem. Fabrik GmbH & Co., Isardamm, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,659

Claims priority, application Austria, Feb. 4, 1977, 151725/77

Int. Cl.[2] C14C *1/00, 1/08*

U.S. Cl. 8—94.14 10 Claims

1. Process for the production of fur skins, comprising steps of treating the skins at a water content of 30–80% by weight in an organic, water-insoluble, substantially non-volatile, liquid carrier medium selected from the group consisting of

high molecular weight, high boiling, liquid hydrocarbons,

high molecular weight, high boiling, liquid chlorinated hydrocarbons,

high molecular weight esters

with tanning chemicals insoluble in said carrier medium and removing after completion of tanning or further chemical process step, respectively, the predominant portion of the carrier medium contained in or adhering to said fur skins by a physical force process selected from the class consisting of centrifuging and squeezing.

4,217,105

PHOTOACTIVATED BLEACH-COMPOSITIONS AND PROCESSES

John F. Goodman, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 22, 1978, Ser. No. 889,067

Claims priority, application Canada, Mar. 28, 1977, 274869

Int. Cl.[2] D06L *3/02*

U.S. Cl. 8—111 13 Claims

1. A detergent bleach composition comprising an organic surfactant and a photoactivator wherein the photoactivator is from about 0.003% to about 0.020% sulfonated zinc phthalocyanine by weight of the composition.

4,217,106

ALKALINE BATHS CONTAINING ALKENE SULFONATES AS WETTING AGENTS

Wolfgang Schneider, Marl; Ferdinand Von Praun, Haltern, and Kurt Niehaves, Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Apr. 13, 1977, Ser. No. 787,052

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620014

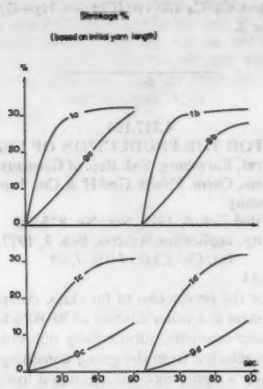
Int. Cl.[2] D06M *1/02*

U.S. Cl. 8—127 9 Claims

6. In a method of mercerizing cellulose fibers by passing said fibers through an aqueous alkalene bath composition comprising about 100–450 grams per liter of a compound selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide and mixtures thereof, the improvement comprising:

adding to said bath composition a wetting agent in a concentration of about 1 to 5 grams per liter of said bath composi-

tion, said wetting agent comprising alkali salts of alkene sulfonic acids having 6 to 10 carbon atoms, a branched



structure with not more than two branches and said branches having 1 to 3 carbon atoms.

4,217,107

METHOD OF MEASURING BLOOD CLOTTING TIME

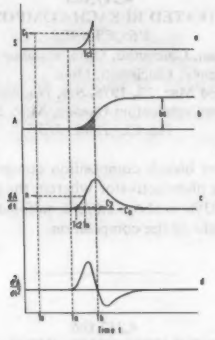
Yukio Saito; Koichi Sekiya, and Masaaki Takahashi, all of Tokyo, Japan, assignors to Sankyo Company Ltd., Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 944,783

Claims priority, application Japan, Sep. 30, 1977, 52-118730

Int. Cl.[2] G01N *33/16*; G06F *15/42*

U.S. Cl. 23—230 B **7 Claims**



1. A method of detecting the blood clotting end point of a blood plasma sample to which a coagulating agent has been added, which includes:

monitoring an electrical signal representing the value A of one or more optical properties of the sample,

substantially continuously deriving the first and second differentials with respect to time of the electrical signals representing the value A,

detecting the moment Ta when the second differential changes from negative to positive or becomes positive,

detecting the moment Tb when the second differential next changes from positive to negative, and

identifying the moment Tb as the true clotting end point only if at least one of the following two conditions are satisfied:

(i) the difference (R) between the tangent to the electrical signals representing the value A at moment Ta and the value of said value A signals exceeds a first predetermined threshold value; and

(ii) the integral, with respect to time from the moment Ta to the moment Tb, of said difference (R) exceeds a second predetermined threshold value.

4,217,108

PROCESS FOR THE QUANTITATIVE DETERMINATION OF THE CARBON OF ORGANIC COMPOUNDS IN WATER

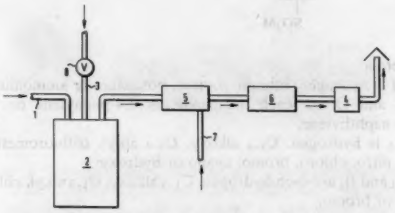
Werner Melzer, Liederbach; Dieter Jaenicke, and Helmut Schroeder, both of Hofheim am Taunus, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 13, 1979, Ser. No. 20,039

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1978, 2811135

Int. Cl.[2] G01N *31/12, 33/18*

U.S. Cl. 23—230 PC **4 Claims**



1. A process for the quantitative determination of total organic carbon present in water (TOC), which comprises

(a) determining the total carbon present in water (TC) by evaporating carbon-containing water at a temperature of about 900° C. in the presence of oxygen to form a CO_2-containing steam wherein said oxygen is present in an amount of from 1 to 5 volume percent calculated on the amount of steam and then measuring the CO_2 concentration,

(b) determining the total inorganic carbon present in water (TAC) by evaporating carbon-containing water at a temperature of about 900° C. without oxygen and then measuring the CO_2 concentration, and

(c) determining the TOC by taking the difference between the TC and TAC values.

4,217,109

COMPOSITION COMPRISING A PULVERIZED PURIFIED SUBSTANCE, WATER AND A DISPERSING AGENT, AND A METHOD FOR PREPARING THE COMPOSITION

Olle L. Siwersson, Helsingborg; Arne E. Wall, Landskrona, and Jan A. T. Loodberg, Helsingborg, all of Sweden, assignors to AB Scaniainventor, Helsingborg, Sweden

Filed May 23, 1978, Ser. No. 908,497

Claims priority, application Sweden, May 31, 1977, 7706315; May 17, 1978, 7805632

Int. Cl.[2] C10L *9/10, 1/32*

U.S. Cl. 44—1 SR **32 Claims**

1. A stabilized coal slurry comprising pulverized and purified coal, water and a dispersing agent, said dispersing agent by selective absorption having produced different charging of particles of coal and particles of other substances to obtain purified coal and maintain the stability of the slurry.

2. Composition as claimed in claim **1**, wherein the dispersing agent is a polyelectrolyte.

17. A method for preparing from a carbonaceous starting material which, in addition to coal, also includes impurities, a stabilized coal slurry containing the coal in pulverized purified

form, as well as water and a dispersing agent, wherein the carbonaceous starting material is mixed with water, pulverized and, in connection with or subsequent to pulverization, supplied with a dispersing agent by selective adsorption produces different charging of coal particles and impurity particles, and wherein this different charging is utilized in order to separate the coal from the impurities and to stabilize the coal slurry.

4,217,110

PROCESS FOR PREPARING A SUSPENSION OF PARTICLES IN A HYDROCARBON OIL

Eke Verschuur, Amsterdam, Netherlands, and Edward G. Masdin, London, England, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 720,703, Sep. 7, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,098

Claims priority, application United Kingdom, Sep. 9, 1975, 37046/75

Int. Cl.[2] C10L *1/32*

U.S. Cl. 44—51 **11 Claims**

1. A process for preparing a suspension of coal particles in a hydrocarbon fuel, comprising agglomerating an aqueous suspension of ash-containing coal particles and a binder in an agglomeration device to produce agglomerates of coal particles and binder, and an ash-containing water phase, separating the agglomerates from the ash-containing water phase and suspending the agglomerates in a hydrocarbon fuel, the agglomerates being disintegrated and the resulting coal particles becoming suspended in the hydrocarbon fuel.

4,217,111

FUEL COMPOSITIONS CONTAINING DIALKYL FORMAMIDES

Kenneth A. Frost, Jr., San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 24, 1975, Ser. No. 644,359

Int. Cl.[2] C10L *1/22*

U.S. Cl. 44—71 **3 Claims**

1. An unleaded gasoline fuel composition, containing less than 0.1 g of lead per gallon, comprising a major amount of a hydrocarbon distillate fuel boiling in the gasoline range and a minor amount, sufficient to moderate the octane requirement of an engine operated with said composition, of a dialkyl formamide in which said alkyl groups each contain from 1 to 9 carbon atoms and the total number of carbon atoms in said alkyl groups is from 7 to 11, said composition being essentially free of nitrogen-containing, polymeric, deposit control additives.

4,217,112

PRODUCTION OF FUEL GAS BY LIQUID PHASE HYDROGENATION OF COAL

Edwin S. Johanson, Princeton, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Dec. 29, 1978, Ser. No. 974,555

Int. Cl.[2] C07C *1/00*; C10G *1/06*

U.S. Cl. 48—210 **22 Claims**

1. A process for the principal production of a methane through propane fuel gas product from coal, wherein the coal is subjected to a liquid-phase thermal hydroconversion reaction without added catalyst, comprising the steps of:

(a) slurrying the coal with a heavy hydrocarbon liquid made in the process and feeding said slurry to the reaction zone;

(b) feeding hydrogen to said reaction zone;

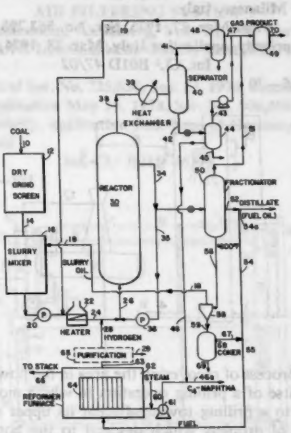
(c) operating said reaction zone at a temperature between 840° F. and 920° F. and at a hydrogen partial pressure between 1000 and 3000 psig;

(d) maintaining a coal throughput rate of 5–50 pounds per hour per cubic foot of reaction space;

(e) removing gaseous and liquid effluent streams from said reaction zone;

(f) separating from said gaseous effluent stream a C_4-naphtha fraction;

(g) passing a major portion of said C_4-naphtha fraction from (f) and steam as feed to a catalytic steam reformer producing hydrogen which is fed to (b);



(h) passing a major portion of said liquid stream from (e) to said steam reformer as fuel for heating said reformer to 1450°–1750° F. temperature; and

(i) recovering from said gaseous stream in (f) the fuel gas product comprising 14–40 weight percent of the coal feed.

4,217,113

ALUMINUM OXIDE-CONTAINING METAL COMPOSITIONS AND CUTTING TOOL MADE THEREFROM

Nam P. Suh, Sudbury; Paul D. Fillion, Cambridge, both of Mass., and Sang H. Lee, St. Paul, Minn., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 806,239, Jun. 13, 1977, abandoned. This application Feb. 8, 1979, Ser. No. 10,296

Int. Cl.[2] B24D *3/08*

U.S. Cl. 51—309 **13 Claims**

1. A shaped article formed from a macroscopically homogeneous composition consisting essentially of (a) from about 10 to 95 weight percent of an oxide composition selected from the group consisting of aluminum oxide, a metal oxide solid solution containing aluminum oxide, a metal oxide multiphase composition containing aluminum oxide, (b) a metallic phase and (c) a reactive metal oxide phase, said reactive metal oxide being formed from a first metal derived from said metallic phase, said first metal being reactive with aluminum oxide under the conditions of formation of said composition wherein said reactive metal oxide has a ΔG of formation per mole of oxygen which is at least equal to the ΔG of formation per mole of oxygen of aluminum oxide, the grain size of said oxide composition being less than about 10 microns.

8. A cutting tool having as its exposed cutting surface the composition of claim 1 containing less than about 25 weight percent of the metallic phase.

4,217,114

PROCESS FOR RECOVERING POWDERS OBTAINED FROM APPARATUSES USED FOR TREATING LIQUID OR SOLID MATERIALS

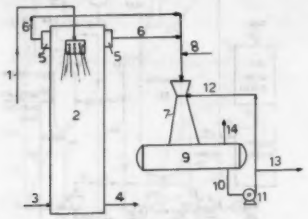
Vincenzo Lagana', Milan, and Umberto Zardi, San Donato Milanese, both of Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

Filed Mar. 27, 1975, Ser. No. 562,798

Claims priority, application Italy, Mar. 28, 1974, 49834 A/74

Int. Cl.[2] B01D *47/02*

U.S. Cl. 55—70 **1 Claim**



1. The process of recovering the urea in the powder formed in the course of a prilling operation in which molten urea is delivered to a prilling tower adjacent its upper end for the formation of droplets which descend to the bottom of the prilling tower through a countercurrent stream of cooling air delivered to the prilling tower adjacent its lower end and which entrains said urea powder, wherein the improvement comprises withdrawing the stream of air and urea powder from the upper end of the prilling tower and feeding said stream to an ejector connected with a collecting tank, feeding water to said stream of air and powder withdrawn from the prilling tower at a point upstream of the ejector so that air and a solution of urea in water are fed to the collecting tank through said ejector, separating said air from the aqueous solution of urea in the collecting tank, recycling a portion of said aqueous solution of urea from the collecting tank to the ejector as the liquid supplying motive power to the ejector so that it transports the urea constituting said powder to the collecting tank, and then obtained urea from said tank.

4,217,115

DRY CLEANING PROCESSES

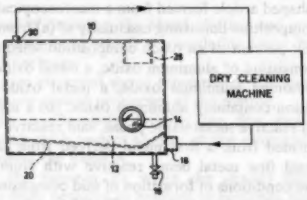
Reginald J. Palmer, 10 Clump Ave., Box Hill Rd., Tadworth, Surrey, England

Filed Jul. 12, 1978, Ser. No. 923,808

Claims priority, application United Kingdom, Jul. 15, 1977, 29836/77

Int. Cl.[2] B01D *47/02*

U.S. Cl. 55—95 **9 Claims**



1. A dry cleaning process, for removing contaminating dry cleaning solvent vapor from a stream of gas from a dry cleaning machine without any loss of said solvent vapor, comprising the steps of:

bubbling said stream of gas through an aqueous liquid so as to facilitate and enhance the removal of said solvent vapor from said stream of gas through conversion of said solvent vapor into a liquid solvent solution;

recovering said liquid solvent from said liquid solvent solution;

recycling said recovered liquid solvent to said dry cleaning machine; and

recycling said decontaminated stream of gas, including any entrained solvent vapor, to said dry cleaning machine.

4,217,116

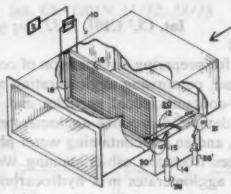
METHOD AND APPARATUS FOR THE CLEANING OF THE SURFACE OF FILTER PANELS IN A FLUID PASSAGEWAY

John Seever, 120-F British Lake Dr., Greensboro, N.C. 27410

Filed May 30, 1978, Ser. No. 910,472

Int. Cl.[2] B01D *46/10, 46/46*

U.S. Cl. 55—96 **8 Claims**



7. An improved method for removing particulate matter collected on a surface loading filter screen which is operatively positioned within a fluid passageway, said method comprising the steps of:

(a) passing a fluid stream through said filter screen;

(b) periodically activating a baffle plate to block said passageway;

(c) moving said filter screen, responsive to blockage of said passageway, to a dumping position removed from said passageway wherein the particulate matter collected on the surface of said filter screen is dumped into a receptacle outside said passageway;

(d) returning said filter screen to its operating position; and

(e) removing said baffle plate from its blocking position responsive to the return of said filter screen to its operating position.

4,217,117

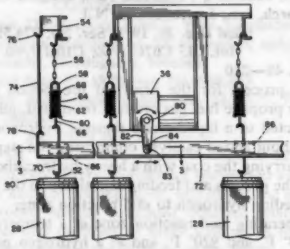
FILTER BAG SUPPORT FOR MULTIPLE BAG FILTERS

Leonard M. Syverson, Upper St. Clair, Pa., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Jun. 19, 1978, Ser. No. 916,479

Int. Cl.[2] B01D *46/04*

U.S. Cl. 55—304 **7 Claims**



1. In a filter mechanism which makes use of a filter housing in which a filter bag is anchored at its lower end and in which a shaker mechanism is operatively connected to an upper end portion of the filter bag for removal of filtered particles col-

lected thereon, means for releasably mounting the filter bag within the housing in a manner to maintain the filter bag in a tensioned relation while providing means for transmitting actuation from the shaker mechanism to the bag comprising a shaker bar mounted for horizontal reciprocal shaking movement, a power source and means for operatively connecting the power source with the shaker bar for actuating the latter in reciprocal shaking movement, an elongate, vertically disposed resilient member, a fixed support, a linking member connected at its upper end portion to the support, a bolt connected at its lower end portion to a lower end portion of the resilient member and releasably connected at its upper end portion to a lower end portion of the linking member at a point above the resilient member, a rod connected at its upper end portion with the upper end portion of the resilient member and releasably connected at its lower end portion with the upper end portion of the filter bag via a hook member located below the resilient member, a retainer plate fixed to the shaker bar through which the hook member extends to enable endwise movement of the hook member relative to the bar while the said hook member moves with the bar during reciprocal movement of the bar, and the linking member being formed so as to permit its length to be variable for mounting the bag under tension.

4,217,118
AIR INTAKE FILTER WITH CYCLONE SEPARATOR STAGE AND DUST COLLECTION PAN

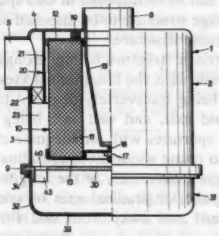
Rudi Köpf, Heutingsheim, and Walter Trefz, Weiler zum Stein, both of Fed. Rep. of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,511

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1977, 2756751

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—330 **7 Claims**



1. An air intake filter assembly of the type which includes a generally pot-shaped filter housing with a longitudinal center axis, air inlet and outlet openings, a strainer-type filter element arranged centrally within the housing, and an annular space between the filter element and the housing wall and centrifuging means for causing the incoming raw air to be subjected to a dust-centrifuging helically swirling flow, prior to entering the filter element, said assembly, comprising:

a dust collecting chamber which is arranged axially adjacent to said filter element and its surrounding annular space, on the axially downstream side of said helically swirling flow, said chamber being defined by a dust collecting pan which is connected to the filter housing and includes a substantially radially extending partition wall separating said annular space from the inside of the dust collecting pan;

a dust discharge opening in the partition wall of the dust collecting pan, leading from said annular space into the dust collecting chamber; and

a dust guide baffle arranged on the inside of the dust collecting pan, in association with its dust discharge opening, the dust guide baffle being so oriented that the dust particles passing through said opening, as a result of said helically swirling flow, are deflected radially towards the center of the dust collecting chamber.

4,217,119
AIR FILTERING SYSTEM

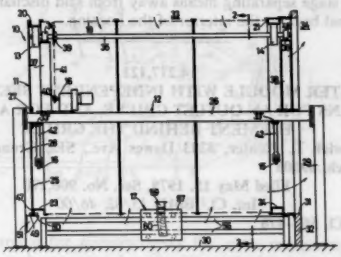
Joachim Fürstenberg, Aichelberg, Fed. Rep. of Germany, assignor to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 725,836, Sep. 23, 1976, abandoned. This application May 16, 1978, Ser. No. 906,400

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1975, 2542568

Int. Cl.[2] B01D *46/26*

U.S. Cl. 55—351 **15 Claims**



1. An air cleaning apparatus comprising:

an elongated air filter drum having two spaced transverse end openings;

means for closing one of said two transverse end openings;

an air filter drum mounting structure having: an elongated mounting shaft; at least two carrier rollers; and means for mounting said at least two carrier rollers to and at spaced locations along the elongated mounting shaft and within the interior of said elongated air filter drum, said at least two carrier rollers being mounted for rotation relative to their respective mounting means;

said elongated air filter drum being supported at spaced locations along its length by said at least two carrier rollers for rotation thereby about said elongated mounting shaft said elongated air filter drum having radially extending flange means at one end thereof;

guide roller means, for cooperating with said radially extending flange means, thereby defining the axial position of said elongated air filter drum; and

drive means operatively engageable with said at least two carrier rollers for imparting rotation to said at least two carrier rollers, and consequently rotation of said elongated filter drum about said elongated mounting shaft.

4,217,120
AIR-OIL SEPARATOR FOR AIRCRAFT GEARBOX

Richard W. Reynolds, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

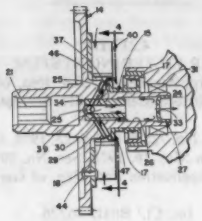
Filed Oct. 20, 1977, Ser. No. 844,014

Int. Cl.[2] B01D *50/00*

U.S. Cl. 55—385 R **11 Claims**

1. In the gearbox housing of an aircraft, the combination of, a gear including a shaft projecting therefrom, said shaft being journaled within the housing, a multi-stage centrifugal separator including an impeller mounted on said gear for initially separating oil from air, second and third stage separating means including inlet passage means integrally formed with said shaft, an air discharge chamber communicating with said

first passage means, and outlet passage means separate from said inlet passage means for directing the oil separated by said



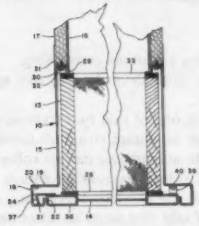
third stage separating means away from said discharge chamber and back to the interior of the housing.

4,217,121

FILTER MODULE WITH INDEPENDENT SECURING MEANS FOR AN OUTLET GRILLE, AND FOR A FILTER ELEMENT BEHIND THE GRILLE

Frederick L. Fichter, 3283 Dawes Ave., SE., Grand Rapids, Mich. 49508

Filed May 15, 1978, Ser. No. 906,270
Int. Cl.[2] B01D *35/02, 46/00*
U.S. Cl. 55—478 **1 Claim**



1. A housing for a clean room air filter of the type having a rigid peripheral frame carrying a sealing gasket at its upper end, said housing comprising:

an upper housing portion having upper and lower ends, said upper end being adapted for connection to an air supply duct;

a lower housing portion having upper and lower ends, said upper end of said lower housing portion being connected to said lower end of said upper housing portion, said lower housing portion being adapted to receive said filter;

a bearing edge projecting downwardly from said lower end of said upper housing portion and within the confines of said lower housing portion for sealingly engaging said gasket;

a lateral extension at said lower end of said lower housing portion extending outwardly around the entire periphery thereof;

a plurality of retaining clips each releaseably connected to said laterial extension and having an end portion adapted to engage the lower end of said peripheral frame of said filter, said clips extending across only a fraction of the width of said peripheral frame;

a grille having a peripheral frame;

means releaseably connecting said peripheral frame of said grille to said lateral extension; and

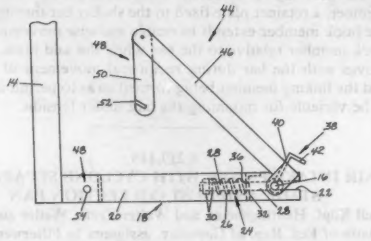
a second sealing gasket positioned on the upper surface of said peripheral frame of said grille and adapted, when said filter is secured within said lower housing portion and said grille is connected to said lateral extension, to sealingly engage both said upper surface of said peripheral frame of said grille and the lower surface of said peripheral frame of said filter including the portions thereof immediately adjacent said retaining clips.

4,217,122

FILTER RETAINING LATCH

Bernard R. Shuler, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Nov. 1, 1978, Ser. No. 956,492
Int. Cl.[2] B01D *46/10;* **E05D** *7/00*
U.S. Cl. 55—480 **8 Claims**



1. A latch assembly for removably clamping a unit filter cell in position against a flow-through frame structure, said latch assembly comprising:

an axle to be spaced from said flow-through frame structure by a distance less than the depth of said unit filter cell, said unit filter cell to be disposed in said space;

an axle carriage structure to be disposed adjacent said flow-through frame structure;

said axle carriage structure having elongated apertures for receiving said axle, the longitudinal axes of said elongated apertures being transversely disposed to the longitudinal axes of said axle, and said axle being received in said elongated apertures with an adequate clearance to allow said axle to rotate about the longitudinal axes of said axle and to move transversely of the longitudinal axes of said axle along the longitudinal axes of said elongated apertures toward and away from said flow-through frame structure;

unit filter cell contacting means rigidly structurally associated with said axle for contacting said unit filter cell when said unit filter cell is disposed in said space between said flow-through frame structure and said axle upon rotation of said axle in one direction and for disengaging from said unit filter cell when said axle is rotated in the opposite direction; and,

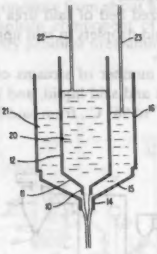
means for biasing said axle in a direction transverse to the longitudinal axes of said axle toward said flow-through frame structure in said elongated slots such that upon rotation of said axle causing said contacting means to contact said unit filter cell said axle is caused to move transversely of its longitudinal axis along said elongated apertures away from said flow-through frame structure against the force of said biasing means, thus, causing said biasing means acting through said filter unit contacting means to exert a force on said unit filter cell in a direction toward said flow-through frame structure

and further comprising means for selectively locking said axle against rotation about the longitudinal axis of said axle when said filter contacting means is in contact with said unit filter cell forcing said unit filter cell against said flow through frame structure

4,217,123
DOUBLE CRUCIBLE METHOD OF OPTICAL FIBER MANUFACTURE

James G. Titchmarsh, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 764,308, Jan. 31, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 926,052
Claims priority, application United Kingdom, Feb. 3, 1976, 04176/76
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—3 A 3 Claims

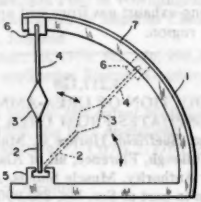


1. A method of making an optical fiber, using a double crucible containing the core and cladding glass melts said crucibles having aligned bushings, comprising the steps of:
pulling the fiber from the glass outfall of the bushings at a rate ensuring a meniscus in the glass at the outfall; and
replenishing the core and cladding glass melts at constant predetermined rates selected to achieve a predetermined fiber core diameter to fiber cladding diameter ratio, whereby the levels of the glass melts in the crucibles will adjust themselves to establish hydrostatic heads in the crucibles sufficient to produce glass melt flow rates through the bushings that exactly match the predetermined glass melt replenishing rates, and the core-to-cladding diameter ratio of the fiber is determined by the replenishing rates and is independent of viscosity and rheological conductance of the glass melts.

4,217,124
METHOD OF FORMING CONOID SURFACES

Stephen Wyden, Box 144, Esperance, N.Y. 12066

Continuation-in-part of Ser. No. 425,901, Dec. 18, 1973, Pat. No. 4,010,020. This application Dec. 6, 1976, Ser. No. 747,599
Int. Cl.[2] C03B *19/04*
U.S. Cl. 65—71 19 Claims

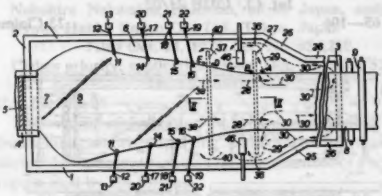


1. A method of making curved surfaces which comprises:
filling a reaction vessel with a plurality of materials, forming a plurality of layers, a portion of which will solidify under the operating conditions; making an adjustment for the rotation of the vessel, including initially off-setting the axis of rotation to an eccentric position to initiate rotation and then reducing the eccentricity to minimize turbulence at the desired rate of revolution;
rotating said material until a desired curvature is formed on the surfaces of the portion of the material to be solidified; adjusting the conditions to cause solidification as the rotation continues, and stopping the rotation, after sufficient solidification, and removal of the formed material.

4,217,125
METHOD AND APPARATUS FOR MANUFACTURING FLAT GLASS ON A MOLTEN METAL BATH

George A. Dickinson, St. Helens, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Nov. 27, 1974, Ser. No. 527,615
Claims priority, application United Kingdom, Dec. 12, 1973, 57661/73
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A 21 Claims



1. Apparatus for manufacturing flat glass comprising an elongated tank structure, having side walls for containing a bath of molten metal, means for delivering glass to the bath at a controlled rate and advancing the glass in ribbon form along the bath, thermal regulators in the tank structure for cooling the advancing ribbon through a viscosity range in which the glass can be attenuated in a zone of the bath sufficiently downstream for such attenuation, means for applying traction to the ultimate ribbon of glass, a first transverse barrier on the floor of the tank structure at the downstream end of said zone, which first barrier extends beyond the position of the edges of the ribbon at the downstream end of said zone but short of said side walls, the top of which first barrier is positioned below the level of the bath surface by a distance which is effective to constrain molten metal flow beneath the ribbon to forward flow of the molten metal entrained beneath the ribbon and counterflow of molten metal alongside the ribbon to replenish molten metal in said attenuation zone, and a second transverse barrier spaced upstream from said first barrier in the region of maximum acceleration of the glass in said zone, the top of which second barrier is positioned below the level of the bath surface by a distance which is effective to constrain molten metal flow beneath the ribbon to forward flow entrained by the accelerating glass, said first and second transverse barriers being arranged and spaced apart to establish lateral paths for inward molten metal flows from said counterflow to replenish the molten metal in said attenuation zone.

11. A method of manufacturing flat glass comprising:
advancing a ribbon of glass along a molten metal bath;
attenuating the advancing glass by applying traction to the ribbon and controlling the speed of advance of the glass to a zone of the bath where the viscosity of the glass is controlled to regulate attenuation of the ribbon to a desired width and thickness as it is accelerated; constraining molten metal flow, at a first location in the region of the downstream end of said attenuation zone, to forward flow of molten metal entrained beneath the ribbon and counterflow of molten metal alongside the ribbon from downstream of said first location;
further constraining molten metal flow, at a second location spaced upstream from said first location and in the region of maximum acceleration of the glass, to forward flow of molten metal entrained beneath the accelerating glass and counterflow of molten metal alongside the ribbon from downstream of said second location; and

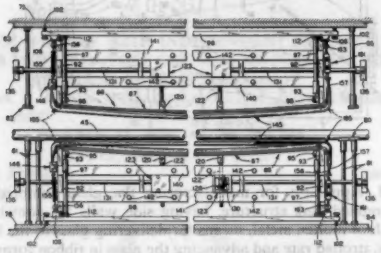
establishing lateral access into the region of the bath supporting the ribbon between said first and second locations for said counterflow of molten metal at said first location to ensure replenishment of the molten metal of the bath in said attenuation zone between said first and second locations by molten metal drawn inwardly from that counterflow at said first location.

4,217,126

METHOD OF AND APPARATUS FOR PRESS BENDING GLASS SHEETS

Floyd T. Hagedorn, Oregon; Donald D. Rahrig; Robert G. Revells, both of Toledo, and James A. Bushong, Swanton, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jan. 5, 1979, Ser. No. 1,174
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—106 **23 Claims**



1. A method of bending a glass sheet comprising: heating a glass sheet to the softening point thereof, supporting said heated sheet in spaced relation to a press member having a first shaping surface corresponding to the marginal outline of said heated sheet and at least one second shaping surface located within the outline of said first shaping surface and floatingly mounted on said press member for free lateral movement relative to said first shaping surface, moving said shaping surfaces simultaneously to engage the marginal edge and an interior portion, respectively, of said sheet to move said sheet toward and against an opposed press member to impart a desired curvature to said sheet, said second shaping surface being movable slightly with said sheet upon engagement therewith.

8. Apparatus for bending a glass sheet comprising: a frame, a pair of opposed press members mounted on said frame for movement relative thereto toward and away from each other, one of said press members having an outline shaping rail provided with a shaping surface conforming to the marginal outline of the glass sheet to be bent, at least one shaping element mounted within said shaping rail and having an irregular shaping surface thereon for imparting a specially configurated shape to an interior portion of said sheet, and means floatingly mounting said shaping element on said press member for free movement relative thereto.

4,217,127

PROCESS FOR PRODUCING UREA GRANULES

Hisashi Kono; Shigeyuki Nakai; Masaki Hisadomi; Norimichi Minemura; Tetsuo Okita, and Sigeru Kawamura, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Feb. 28, 1979, Ser. No. 15,902
Claims priority, application Japan, Mar. 3, 1978, 53-23645
Int. Cl.[2] C05C *9/00*
U.S. Cl. 71—28 **24 Claims**

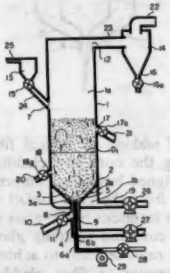
1. A process for producing urea granules in a fluidized bed formed in a vertical cylindrical region which is partitioned into an upper portion and a lower portion thereof by means of a funnel shaped partition converging toward a bottom thereof, said upper portion is connected to said lower portion through a number of holes formed in said partition, which process comprises the steps of:

(A) feeding solid seed particles of urea into said upper portion of said cylindrical region;

(B) atomizing and injecting upward a stream of a liquid containing a material to be incorporated onto said urea seed particles, into said upper portion of said cylindrical region through a nozzle having a top end thereof located just above a center of said bottom of said funnel-shaped partition, said liquid being forwarded to said nozzle through a path extending through said lower portion of said cylindrical region;

(C) forming a fluidized bed of said urea seed particles and said atomized liquid droplets in said upper portion of said cylindrical region,

(a) by blowing a number of streams of an inert gas not reactive to urea and said liquid, and having a temperature of from 50° to 98° C., from said lower portion into



said upper portion of said cylindrical region through said holes of said funnel-shaped partition, and

(b) by blowing upward a stream of an inert gas not reactive to urea and said liquid and having a temperature of from 30° to 120° C. into said upper portion of said cylindrical region through an annular opening formed in said bottom of said partition and surrounding said atomizing nozzle of said liquid, said inert gas being introduced to said annular opening through a path extending through said lower portion of said cylindrical region,

whereby said atomized liquid droplets are allowed to adhere onto said urea seed particles and dried or solidified;

(D) discharging the resultant urea granules from said upper portion of said cylindrical region through said annular opening and said inert gas path, and;

(E) discharging exhaust gas from said upper portion of said cylindrical region.

4,217,128

PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES FROM UREA PHOSPHATE

John M. Stinson, Sheffield; Horace C. Mann, Jr., Killen, and John F. McCullough, Florence, all of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation-in-part of Ser. No. 883,990, Mar. 6, 1978, abandoned, which is a continuation of Ser. No. 838,503, Oct. 3, 1977, now Defensive Publication No. T973,004. This application Jul. 13, 1979, Ser. No. 57,247
Int. Cl.[2] C05P *7/00, 13/00*
U.S. Cl. 71—29 **3 Claims**

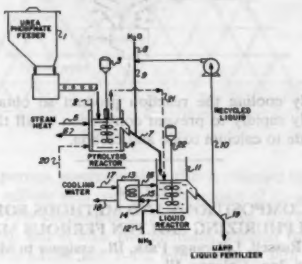
1. A process for the production of high-purity urea-ammonium polyphosphate liquids, which process consists of the steps of:

(1) heating at about atmospheric pressure solid urea orthophosphate to a temperature in the range from about 260°

F. to about 350° F., thereby converting said solid urea orthophosphate to the melt phase;

(2) continuously agitating by mechanical means the resulting melt, said agitation being sufficient to ensure control of foam produced in said melt and caused by evolution of carbon dioxide therein, said agitation effecting release of said carbon dioxide from said foam to the atmosphere;

(3) maintaining the resulting melt of urea phosphate at said temperature for a period of about 1 to about 30 minutes to simultaneously effect the pyrolysis of from about 0.05 moles urea per mole H_3PO_4 to about 0.578 moles urea per mole H_3PO_4 of the urea component of said orthophosphate and to condense from about 8 to about 90 percent of the orthophosphate component of said urea orthophosphate to directly produce urea-ammonium polyphosphate



PRODUCTION OF HIGH-PURITY UREA-AMMONIUM POLYPHOSPHATE LIQUID FERTILIZER BY THERMAL DECOMPOSITION OF UREA PHOSPHATE

melts, said melts being mixtures of urea and ammonium polyphosphate, said ammonium polyphosphate being of the general formula $(NH_4)_nH_2P_nO_{3n+1}$, where n is the average chain length of the ammonium polyphosphate and ranges from greater than about 1.05 to less than about 3; and

(4) subsequently dissolving the resulting pyrolyzed urea ammonium polyphosphate melt in relatively weak aqua ammonia to produce said highpurity urea ammonium polyphosphate liquid, the concentration of said ammonia in said relatively weak aqua ammonia being sufficient to adjust the final pH of said polyphosphate liquid to a near neutral value to maximize the solubility of the poiyphosphate in aqueous solution and minimize the deleterious corrosive characteristics thereof.

4,217,129

FUNGICIDAL AND HERBICIDAL TRIAZOLE KETONES

Margaret C. Shephard, and Paul A. Worthington, both of Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Apr. 26, 1978, Ser. No. 900,317

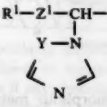
Claims priority, application United Kingdom, May 5, 1977, 18861/77

The portion of the term of this patent subsequent to Dec. 19, 1995, has been disclaimed.

Int. Cl.² A01N *9/22*; C07D *233/60, 249/08*

U.S. Cl. 71—76 **9 Claims**

1. A compound of formula:



wherein each of R^1 and R^2, which may be the same or different, is C_{3-6} cycloalkyl optionally substituted with one methyl, C_{1-5} alkyl optionally substituted with up to three halogeno or phenyl optionally substituted with up to three substituents selected from the class consisting of halogen, C_{1-5} alkyl, C_{1-5} alkoxy or nitro, Y is =N- and one of Z^1 and Z^2 is C=O and the other is —CH(OH)—.

9. A method of combating fungal diseases in, or for stunting the growth of, a plant, the method comprising applying to the plant, to seed of the plant or to the locus of the plant or seed, a fungicidally effective amount of a plant growth stunting amount of a compound according to claim 1.

4,217,130

AGENTS FOR AND METHOD OF MODIFYING CITRUS FRUIT

Teruyuki Tsuruta, Fussa; Masanobu Kawai, Machida; Ikuo Matsukuma, Machida; Masayuki Teranishi, Machida, and Nobuhiro Nakamizo, Machida, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

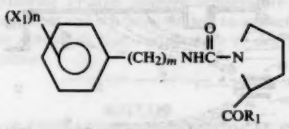
Filed Oct. 24, 1978, Ser. No. 954,210

Claims priority, application Japan, Oct. 29, 1977, 52-130131

Int. Cl.² A01N *9/22*

U.S. Cl. 71—95 **2 Claims**

1. A method of decreasing the organic acid content of citrus fruit which comprises applying to citrus trees bearing said fruit during the maturity thereof an effective amount of a compound represented by the formula



wherein X_1 represents a hydrogen atom, a lower alkyl group, a chlorine atom or a nitro group; n is an integer of 1–5; m is 0 or 1; R_1 is a hydroxyl group, a lower alkoxy group, or

wherein R_2 and R_3 may be the same or different and are a hydrogen atom, lower alkyl group, or an optionally substituted phenyl group; and when n is 2 or more, X_1 may be the same or different.

4,217,131

HERBICIDAL COMPOSITION

Teruhiko Toyama, Fujisawa; Osamu Morikawa, Chigasaki; Toshimi Tanaka, Chigasaki; Yoshikata Hojo, Chigasaki; Yoshio Takasawa, Chigasaki, and Taisuke Kurechi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

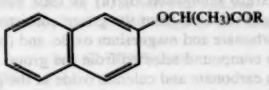
Filed Sep. 12, 1975, Ser. No. 613,034

Claims priority, application Japan, Sep. 24, 1974, 49-108856

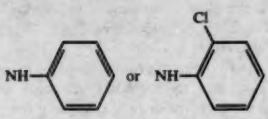
Int. Cl.² A01N *9/20*

U.S. Cl. 71—108 **13 Claims**

1. A herbicidal composition comprising as active ingredients herbicidally effective amounts of at least one α-(β-naphthoxy)-propionic acid derivative expressed by the formula:



wherein R represents OH, OCH_3,



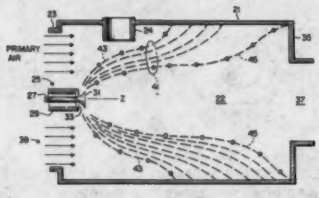
and N-(butoxymethyl)-2-chloro-2',6'-diethyl acetanilide, the ratio of N-(butoxymethyl)-2-chloro-2',6'-diethyl acetanilide to α-(β-naphthoxy)propionic acid derivative being about 0.179–2.8:1 by weight, said composition being herbicidally effective against both perennial weeds and annual weeds at applications of 10–40 g/are based on the total weight of said active ingredients.

4,217,132

METHOD FOR IN-FLIGHT COMBUSTION OF CARBONACEOUS FUELS

Harland L. Burge, Garden Grove; John A. Hardgrove, Rolling Hills Estates, and Walter F. Krieve, Rancho Palos Verdes, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 27, 1977, Ser. No. 837,234
Int. Cl.[2] C22B *1/10*
U.S. Cl. 75—26 **17 Claims**



1. In a method of combusting carbonaceous fuel, the steps of:

injecting particulate carbonaceous fuel, fluidized with a carrier fluid, into a combustion zone and through the center portion of one end thereof;

directing a first stream of oxidizer gas longitudinally into said zone through said fuel injection end, and a second stream of oxidizer gas tangentially into said zone, wherein the mass flow ratio and velocities of said streams are regulated to provide wheel type flow in the combustion zone and to convert substantially all of the carbon content of the fuel particles to gaseous compounds within residence times of about 100 milliseconds.

4,217,133

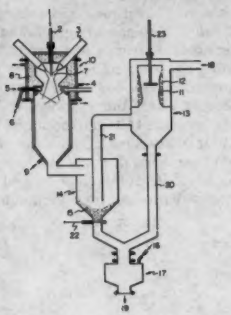
REFINING ADDITIVE AND PROCESS FOR PREPARING SAME

Takeshi Goto, Atsugi; Noboru Kawakami, Tokyo; Itsuo Hirano, Sagamihara, and Yuji Kawahara, Chigasaki, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Mar. 22, 1979, Ser. No. 22,837
Claims priority, application Japan, Mar. 24, 1978, 53-33042
Int. Cl.[2] C21C *7/00*
U.S. Cl. 75—58 **7 Claims**

1. A process for preparing an additive for use in metal-refining, which comprises the steps of:

maintaining, at a temperature of from 1,600° C. to 4,000° C., and mixture comprised of (a) at least one magnesium compound selected from the group consisting of magnesium carbonate and magnesium oxide, and (b) at least one calcium compound selected from the group consisting of calcium carbonate and calcium oxide in the presence of a carbonaceous material, in a non-oxidizing atmosphere, for a time sufficient to form a mixture containing metallic magnesium, magnesium oxide, calcium carbide and calcium oxide and then;



suddenly cooling the reaction product so obtained sufficiently rapidly to prevent conversion of all the calcium carbide to calcium oxide and carbon.

4,217,134

COMPOSITIONS AND METHODS FOR DESULPHURIZING MOLTEN FERROUS METALS

Robert E. Russell, LaGrange Park, Ill., assignor to Molten Steel Products, Inc., Chicago, Ill.

Filed Jun. 13, 1979, Ser. No. 48,146
Int. Cl.[2] C22B *9/10*; C21C *7/02*
U.S. Cl. 75—58 **7 Claims**

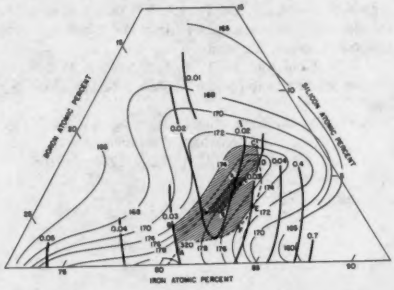
1. A composition useful in the desulphurization of molten steel consisting essentially of 50–75% of pulverized lime, 20–30% of finely divided fluorspar, and 3–20% of finely divided aluminum particles, said percentages being by weight.

4,217,135

IRON-BORON-SILICON TERNARY AMORPHOUS ALLOYS

Fred E. Luborsky, Schenectady, and John L. Walter, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 36,197, May 4, 1979, and Ser. No. 898,482, Apr. 20, 1978, abandoned. This application Nov. 29, 1978, Ser. No. 964,621
Int. Cl.[2] C22C *1/00, 31/00, 37/00, 19/07*
U.S. Cl. 75—123 L **5 Claims**



1. An iron-boron-silicon amorphous metal alloy simultaneously having values of saturation magnetization at about 30° C. of at least about 174 emu/g, intrinsic coercivity of less than about 0.03 oersteds and crystallization temperature of at least about 320° C., said alloy consisting essentially of iron, boron

and silicon and having a composition in the region A, B, C, D, E, F, A of FIG. 4.

4,217,136

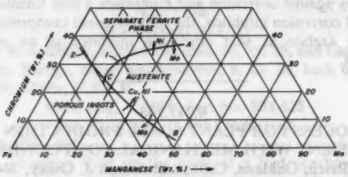
CORROSION RESISTANT AUSTENITIC STAINLESS STEEL

Albert G. Hartline, III, Albany, N.Y., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 465,782, May 1, 1974, abandoned. This application Jan. 26, 1979, Ser. No. 6,714

Int. Cl.[2] C22C *39/20*

U.S. Cl. 75—128 A **7 Claims**



1. A nonporous, austenitic alloy that is resistant to chloride pitting and sulfuric acid consisting essentially of 21–45% manganese, 10–30% chromium, 0.85–3% nitrogen, 0–1% carbon, 0–2% silicon, and at least two elements selected from 1–3% copper, 1–4% nickel, and 1–4% molybdenum, with the combind weight of copper, nickel and molybdenum not exceeding 5%, and the balance iron and residuals, wherein the composition is such that:

$$\%Cr + \%Mo + 0.8\,(\%Mn) - 11.8\,(\%N - 0.1) - 1.23\,(\%Ni) - (28.5 + \%Cu) \geq 0 \quad (1)$$

$$\frac{30\,(\%C + \%N) + 0.5\,(\%Mn) + \%Ni}{\%Cr + \%Mo + 1.5\,(\%Si)} \geq 1.5. \quad (2)$$

4,217,137

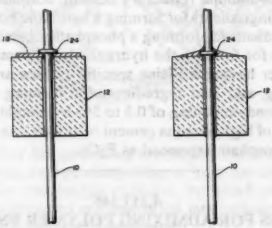
GOLD BASED ALLOY COMPOSITION AND BRAZING THEREWITH, PARTICULARLY FOR CERAMIC-METAL SEALS IN ELECTRICAL FEEDTHROUGHS

Robert E. Kraska, Minneapolis, and Joseph F. Lessar, Anoka, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 885,489, Mar. 13, 1978. This application Feb. 26, 1979, Ser. No. 15,335

Int. Cl.[2] C22C *5/00*

U.S. Cl. 75—165 **10 Claims**



1. An alloy particularly suitable for brazing and metallizing consisting, in addition to minor amounts of impurities and incidental elements if any, essentially of gold in a predominant amount, a minor amount of vanadium, a minor amount of a constituent selected from the group consisting of yttrium, scandium and mixtures thereof, and optionally including a minor amount of niobium.

4,217,138

NICKEL ALLOY HEATER IN GLOW PLUG

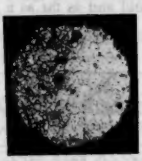
Tsuneo Ito, Nagoya, Japan, assignor to NGK Spark Plug Co. Ltd., Nagoya, Japan

Filed Aug. 24, 1978, Ser. No. 936,553

Claims priority, application Japan, Aug. 27, 1977, 52-102881

Int. Cl.[2] C22C *19/03*

U.S. Cl. 75—170 **7 Claims**



1. In a glow plug containing a heater therein, the improvement wherein said heater is a nickel alloy consisting essentially of 0.05 to 2.0% by weight of an additive metal incapable of forming a solid solution with nickel selected from the group consisting of yttrium, zirconium, ruthenium, Misch metal, rare earth elements and mixtures thereof, the remainder of said nickel alloy being nickel, said heater being mechanically strong, maintaining a large positive temperature electrical resistance coefficient and not being subject to coarsening of the crystal grains thereof at high temperature or degradation at high temperature.

4,217,139

PROCESS OF PREPARING AN ELECTRICAL CONTACT MATERIAL

Han J. Kim, Greensburg, Pa.; Thomas E. Peters, Chelmsford, Mass., and David Snee, Murraysville, Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 832,097, Sep. 9, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,507

Int. Cl.[2] B22F *3/00*

U.S. Cl. 75—206 **7 Claims**

1. A method of preparing an electrical contact comprising, (a) blending together silver powder having sub-micron size particles with cadmium oxide having particles of less than two micron size to form an intimate mixture thereof, (b) reducing said cadmium oxide at a temperature from about 321° C. to about 550° C. to form an an alloy powder of silver and cadmium, (c) maintaining the temperature of the alloy powder formed in step b at a temperature greater than about 321° C. while changing said reducing atmosphere to an oxidizing atmosphere, (d) oxidizing said alloy powder in an oxidizing atmosphere at a temperature greater than about 321° C. to oxidize said cadmium and precipitate cadmium oxide within grains of silver to form a silver-cadmium oxide alloy powder, (e) compacting, sintering, and forming said silver-cadmium oxide alloy powder into an electrical contact.

4,217,140

METHOD AND APPARATUS FOR EXTRUSION PRESSING OF A GRANULATED, PREFERABLY POWDER-METALLURGIC MATERIAL

Werner Waldhüter, Stadtallendorf, and Klaus Lichtinghagen, Kirchhain, both of Fed. Rep. of Germany, assignors to Glacier GmbH - DEVA Werke, Stadtallendorf, Fed. Rep. of Germany

Filed Jun. 30, 1978, Ser. No. 920,965

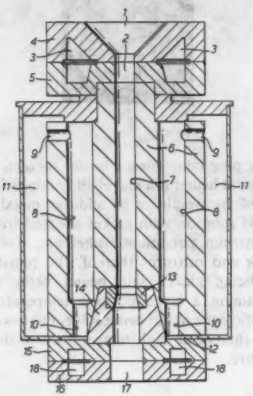
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1977, 2733009

Int. Cl.[2] B27F *5/00*

U.S. Cl. 75—214 **14 Claims**

1. Method for the extrusion molding of a granular, powdered metallurgic material, whereby said material is continu-

ously fed into a continuous press mold where it is precompacted in a cold process by means of continual strokes of a plunger against the frictional resistance built up by a section of an already compressed rod, pushed through said press mold by the pressure of the subsequent stroke of the plunger and sintered in said press mold, wherein a constant plunger stroke is utilized, the material being immediately heated for sintering during its press mold passage and subsequent to its cold precompaction and being sintered during the remaining passage through said press mold and as far as a die from which it is continually extruded.



12. Device for the extrusion molding of a granular, powdered metallurgic material, with a feeding device to accept the granular substance, a plunger for the pre-compaction in a cold process of the granular substance in the press-mold passage, a press mold passage arranged downstream from the feeding device and including a heating device to heat the rod of material for the purpose of sintering within the press mold passage, wherein the heating device for the heating of the rod of material is provided beginning at a distance from the inlet of the press mold passage which corresponds to approximately the constant plunger depth inside the press mold, said heating device reaching as far as at least one uncooled die at the outlet of the press mold passage.

4,217,141

PROCESS FOR PRODUCING HARD, WEAR-RESISTANT BORON-CONTAINING METAL BODIES

Karl Schrittwieser, Edenvale, South Africa, assignor to Sintermetallwerk Krebsöge GmbH, Krebsöge, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,639

Claims priority, application South Africa, Mar. 9, 1977, 77/1419

Int. Cl.² C22C *1/04, 1/05*

U.S. Cl. 75—244 **11 Claims**

1. A method of producing a hard, wear-resistant body which comprises the steps of:

mixing a metal powder with 0.5 to 25% by weight of the metal powder of a boronizing agent selected from the group which consists of a boron, boron carbide and titanium boride;

compacting the mixture to a density of at least 80% of the theoretical density of said mixture;

sintering the resulting compact at a temperature of 700° to 1300° C. under nonoxidizing conditions to form said body and effect diffusion of boron from said boronizing agent into the metal powder and substantially homogeneous distribution of the boron in said body; and

adding to the mixture a boronizing activator in an amount of up to 30% by weight of said boronizing agent.

4,217,142

METAL COATING COMPOSITIONS

John E. O. Mayne, Cambridge, and Peter J. Heyes, Barnsley, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 714,397, Aug. 16, 1978. This application May 17, 1978, Ser. No. 907,015

Claims priority, application United Kingdom, Aug. 29, 1975, 35718/75

The portion of the term of this patent subsequent to Jan. 23, 1996, has been disclaimed.

Int. Cl.² C09D *5/08*

U.S. Cl. 106—14.36 **12 Claims**

1. In a protective coating composition which protects metal surfaces against corrosion and comprises a film forming vehicle and corrosion inhibitor, the improvement comprising magnesium azelate as said corrosion inhibitor in an effective amount.

4,217,143

PROCESS FOR PLANT SCALE PRODUCTION OF CEMENT WITH MECHANICAL COMPOUNDING

Harry Reich, Oakland, Calif., and Joseph J. Coney, 244 Lakeside Dr., Apt. #15, Oakland, Calif. 94612, assignors to Joseph J. Coney, Oakland, Calif.

Filed Apr. 9, 1979, Ser. No. 28,261

Int. Cl.² C04B *7/36*

U.S. Cl. 106—100 **12 Claims**

1. An improved method of producing on a production plant scale a cementitious material by mechanical compounding of constituent material of at least calcium oxide, silicon dioxide and aluminum oxide comprising the steps of:

grinding said constituent materials to approximately a 200 mesh size;

mixing said ground constituent materials to a uniformly blended material; and subsequently in a separate step,

impact compounding said ground and blended constituent material by mechanical impacting of said uniformly blended material until said constituent materials have reacted to form a cementitious material.

4,217,144

HIGH ALUMINA REFRACTORY CEMENT AND A PROCESS FOR PRODUCING THE SAME

Alain Mathieu, Montelimar, France, assignor to Lafarge Fondu International, Neuilly sur Seine, France

Continuation of Ser. No. 775,840, Mar. 9, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,135

Claims priority, application France, Jan. 5, 1977, 77 00130

Int. Cl.² C04B *7/32*

U.S. Cl. 106—104 **22 Claims**

1. A high-alumina refractory cement, consisting essentially of alumina ingredients for forming a hydraulic bond and one or more ingredients for forming a phosphatic chemical bond, said ingredients for forming the hydraulic bond comprising aluminous clinker having a Blaine specific surface area of 3000 to 5000 cm^2/g and said ingredients for forming a phosphatic chemical bond consisting of 0.5 to 5% by weight in relation to the weight of high-alumina cement of at least one water soluble alkaline phosphate expressed as P_2O_5.

4,217,145

PROCESS FOR ADMIXING POLYMER EMULSIONS WITH WATER TO PRODUCE HIGHLY VISCOUS LIQUIDS

Preston G. Gaddis, 301 N. Quapaw, Bartlesville, Okla. 74003

Continuation of Ser. No. 758,705, Jan. 12, 1977, abandoned. This application Apr. 26, 1979, Ser. No. 33,510

Int. Cl.² C08L *1/08, 5/00, 33/26*

U.S. Cl. 106—170 **8 Claims**

1. A process for dissolving a high molecular weight polymer in water to form a highly viscous liquid having a viscosity

ranging from about 100 centipoises to about 5,000 centipoises; which process comprises the steps of:

(a) admixing water with an emulsion containing said polymer;

(b) charging the resulting admixture at a pressure ranging from about 15 to about 300 psi through an orifice that restricts the cross-sectional area of flow of said admixture;

(c) discharging the admixture into a turbulent zone having a pressure of about 1 psi;

(d) agitating the admixture within said turbulent zone by at least one impeller means; and thereafter

(e) withdrawing the liquid thus formed from the turbulent zone.

4,217,146

PLUGGING FLUID

Georgy R. Avdzhiev, ulitsa Oplesnina, 30, kv. 25, and Leonid M. Ruzin, Yarega, ulitsa Kosmonavtov, 5, kv. 26, both of Komi ASSR, Ukhta, U.S.S.R.

Filed Aug. 7, 1978, Ser. No. 931,425

Int. Cl.[2] C04B *43/00*; C09K *7/06*

U.S. Cl. 106—285 **6 Claims**

1. A plugging fluid on the basis of a hydrocarbon liquid having the characteristics of highly viscous crude oil and a weighting material, where said weighting material is titanium dioxide having a particle size of up to 0.5μ, the aforesaid components being taken in the following amounts in percent by weight:

hydrocarbon liquid: 60 to 80

titanium dioxide: 20 to 40.

4,217,147

FACILITY FOR GENERATING TECHNICALLY USEABLE ENERGY BY CONVERSION OF SOLAR ENERGY

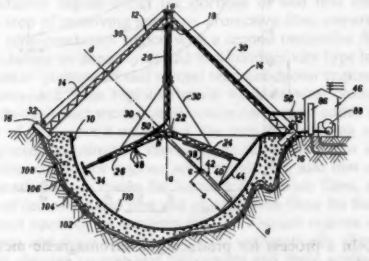
Georg Ziemba, Langenäckerstr. 29, 7462 Frommern, Fed. Rep. of Germany

Division of Ser. No. 800,571, May 25, 1977. This application Dec. 21, 1978, Ser. No. 971,920

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624672

Int. Cl.[2] H01L *31/04*; F24J *3/02*

U.S. Cl. 136—89 HY **28 Claims**



1. In a facility for generating technically useable energy by converting solar energy comprising at least one concave mirror and at least one energy collector, by which reflected sun rays can be intercepted and converted into technically useable energy, the improvement comprising:

(a) the mirror being a stationary spherical mirror for focusing the solar radiation;

(b) means supporting the energy collector such that it is brought to the theoretical focal point of the spherical mirror along its optical axis;

(c) said energy collector extending along the optical axis in a direction toward the circumference of the spherical mirror and having annular zones stacked on top of each other as seen in the direction of the axis at the periphery of the energy collector, each zone having solar cells disposed at its circumference for energy conversion into d-c current, the peripheral surface of said annular zones defined by the solar cells being of conical shape in such a manner that the solar radiation reflected from any point of the concave mirror strikes the solar cells substantially perpendicularly;

(d) means for moving said energy collector relative to the spherical mirror about an axis going through the center of the latter to follow the changing position of the sun; and

(e) means for cooling said energy collector.

4,217,148

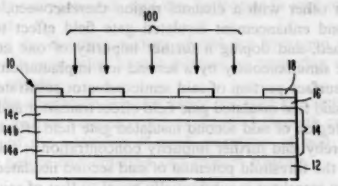
COMPENSATED AMORPHOUS SILICON SOLAR CELL

David E. Carlson, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,496

Int. Cl.[2] H01L *31/06*; B05D *3/06*

U.S. Cl. 136—89 SJ **16 Claims**



1. In an amorphous silicon solar cell which comprises an electrically conductive substrate, a layer of glow discharge deposited hydrogenated amorphous silicon having regions of differing conductivity with at least one region of intrinsic hydrogenated amorphous silicon, said layer of hydrogenated amorphous silicon having opposed first and second major surfaces where said first major surface contacts said electrically conductive substrate, and means for electrically contacting said second major surface, the improvement wherein the intrinsic hydrogenated amorphous silicon region is compensated with a suitable P-type dopant in a concentration sufficient to reduce the space charge density under illumination to substantially neutral.

4,217,149

METHOD OF MANUFACTURING COMPLEMENTARY INSULATED GATE FIELD EFFECT SEMICONDUCTOR DEVICE BY MULTIPLE IMPLANTATIONS AND DIFFUSION

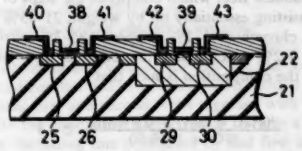
Tamaki Sawazaki, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Division of Ser. No. 828,852, Aug. 29, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 14,922

Claims priority, application Japan, Sep. 8, 1976, 51-108602

Int. Cl.[2] H01L *21/263, 7/54, 21/225*

U.S. Cl. 148—1.5 **6 Claims**



1. A method for manufacturing a complementary insulated

gate field effect semiconductor device, comprising the steps of preparing a semiconductor substrate of one conductivity type, doping an impurity of the opposite conductivity type in a portion of said semiconductor substrate by a first ion implantation process for forming a well region of the opposite conductivity type whereby the impurity concentration in said well region is sufficiently high for causing a withstand voltage of a PN junction formed in said well region to be larger than a driving voltage of said insulated gate field effect semiconductor device and for causing a field inversion voltage of said well region to be larger than said driving voltage, said well region constituting a field portion of said insulated field effect semiconductor device, diffusing an impurity of the opposite conductivity type in portions of said semiconductor substrate for forming source and drain regions of the opposite conductivity type spaced apart from each other with a channel region therebetween, whereby a first enhancement insulated gate field effect transistor is formed, diffusing an impurity of one conductivity type in portions of said well region for forming source and drain regions of one conductivity type spaced apart from each other with a channel region therebetween, whereby a second enhancement insulated gate field effect transistor is formed, and doping a further impurity of one conductivity type simultaneously by a second ion implantation process in the surface portion of said semiconductor substrate surrounding said first insulated gate field effect transistor and said channel region of said second insulated gate field effect transistor, whereby said further impurity concentration is selected such that the threshold potential of said second insulated gate field effect transistor is substantially equal to that of said first insulated gate field effect transistor in terms of the absolute value, and that the field inversion voltage of the field portion of said first insulated gate field effect transistor is larger than the driving voltage of said first insulated gate field effect transistor.

4,217,150

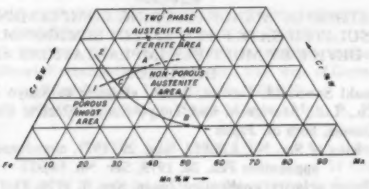
CORROSION RESISTANT AUSTENITIC STEEL

Albert G. Hartline, III, Brackenridge, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 503,225, Sep. 5, 1974, abandoned, which is a division of Ser. No. 355,394, Apr. 30, 1973, Pat. No. 3,907,551. This application Jan. 26, 1979, Ser. No. 6,716

Int. Cl.[2] C21D *7/14*

U.S. Cl. 148—2 **2 Claims**



1. A method for producing a substantially non-porous austenitic stainless steel which comprises the steps of preparing a melt consisting essentially of, by weight, 21–45% manganese, 10–30% chromium, 1–3% copper, 0.85–3% nitrogen, 0–1% carbon, 0–2% silicon and the balance iron and residuals wherein the composition is such that

$$\frac{30(\%C + \%N) + 0.5(\%Mn)}{\%Cr + 1.5(\%Si)} \geq 1.5 \quad (1)$$

$$\%Cr + 0.8(\%Mn) - 11.88(\%N - 0.1) - (28.5 + \%Cu) \geq 0; \quad (2)$$

casting said melt; and air cooling or quenching the casting in the temperature range of from 1600° F. to 1000° F.

4,217,151

CERMET TYPE MAGNETIC MATERIAL

Hideaki Mizuno, and Susumu Terawaki, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Jan. 26, 1979, Ser. No. 6,895

Claims priority, application Japan, Jan. 27, 1978, 53/8119

Int. Cl.[2] C04B *35/00*

U.S. Cl. 148—31.55 **3 Claims**

1. A magnetic material which comprises SiO and at least one ferromagnetic metal selected from the group consisting of Fe, Co, and Ni, and takes the form of a thin film of an amorphous cermet grown on a surface of a substrate by simultaneous vacuum evaporation of SiO and said at least one ferromagnetic metal, the proportion of the total number of the atoms of said at least one ferromagnetic metal in said film to the number of the molecules of SiO in said film being in the range from 60:40 to 98:2.

4,217,152

PROCESS FOR PRODUCTION OF FERROMAGNETIC POWDER

Masashi Aonuma, and Yasuo Tamai, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

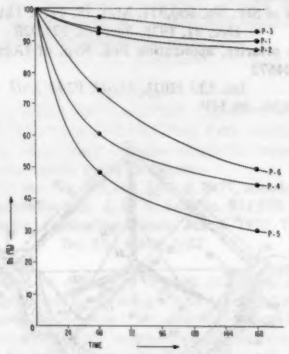
Filed Nov. 18, 1974, Ser. No. 524,860

Claims priority, application Japan, Nov. 16, 1973, 48/128989

The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.[2] C21B *15/00*; C22C *33/02*; C21D *1/04*; H01F *1/06*

U.S. Cl. 148—108 **8 Claims**



1. In a process for producing a ferromagnetic metal alloy suitable for use in a magnetic recording medium by reducing, in aqueous solution, a metal salt containing a ferromagnetic metal alloy comprising Fe, Fe-Co, Fe-Ni, Fe-Co-Ni or mixtures thereof by reacting said ferromagnetic metal salt with a compound selected from the group consisting of borohydride compounds and boron and hydrogen containing derivatives thereof,

the improvement comprising carrying out the reduction of said ferromagnetic metal alloy in the presence of at least one titanium compound in said aqueous solution,

(a) the concentration of said metal salt in said aqueous solution being from about 0.002 to 2 mole/liter, and

(b) said titanium compound and said metal salt being present in said solution in a molar ratio of from about 0.001:1 to 0.5:1.

4,217,153
METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

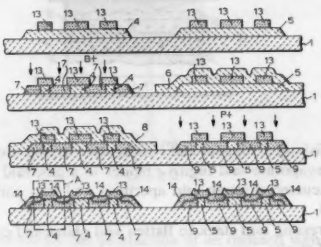
Shinobu Fukunaga, and Akihiko Yasuoka, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,861

Claims priority, application Japan, Apr. 4, 1977, 52/38763; Apr. 13, 1977, 52/42881

Int. Cl.² H01L *21/22*

U.S. Cl. 148—187 **1 Claim**



1. In a method of manufacturing a complementary MOS integrated circuit device, the steps of forming a first semi-conductor region of a first conductivity type and a second semi-conductor region of a second conductivity type on a substrate of a monocrystalline insulator or on a substrate of a semi-conductor single crystal with said regions isolated from each other, the step of forming a first mask film of a material resistant to thermal oxidation and covering that part of said first semi-conductor region which is to become a channel region and those parts thereof at which metallic interconnections are to be formed, and forming a second mask film of a material resistant to thermal oxidation covering that part of said second semi-conductor region which is to become a channel region and those parts thereof at which metallic interconnections are to be formed, the step of covering said second semi-conductor region with a first protective film and introducing an impurity of said second conductivity type into the unmasked portions of said second semi-conductor region to form source and drain regions therein while leaving channel regions through said first semi-conductor region under the portions of said first mask film, the step of removing said first protective film, covering said first semi-conductor region with a second protective film and introducing an impurity of said first conductivity type into the unmasked portions of said second semi-conductor region to form source and drain regions therein while leaving channel regions through said second semi-conductor region under the portions of said second mask film, the step of removing said second protective film and thermally oxidizing said first and second semi-conductor regions while employing said first and second mask films as masks for forming field oxide films, and the step of removing said first and second mask films for forming contact opening for contacts for said channel regions and said source and drain regions which are automatically aligned with said channel regions and said source and drain regions.

4,217,154
METHOD FOR CONTROL OF AN OPEN GALLIUM DIFFUSION

Gerhard Popp, Lampertheim, and Gerhard Held, Bürstadt, both of Fed. Rep. of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 30, 1978, Ser. No. 955,713

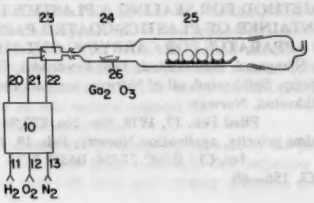
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751163

Int. Cl.² H01L *7/34*

U.S. Cl. 148—189 **3 Claims**

1. In a method of controlling a gallium diffusion with at least one silicon wafer in an open tube of a diffusion oven including a source oven and a main oven, wherein a gas mixture of water vapor and mainly hydrogen is passed over gallium trioxide (Ga_2O_3) and the volatile sub-oxide (Ga_2O) produced by reduction is then carried in a gas stream to the silicon wafer, with additional control of the gallium concentration in the silicon by dilution of the gas mixture with nitrogen, the improvement comprising:

introducing dry hydrogen into said open tube;



mixing precisely dosed additions of relatively small quantities of dry oxygen with said dry hydrogen in said open tube; and

combusting the resulting mixture of said dry hydrogen and said dry oxygen prior to said mixture encountering said gallium trioxide;

whereby the admixture of water vapor required for controlling the gallium concentration is obtained through combustion of the additions of small quantities of said dry oxygen before encountering said gallium trioxide.

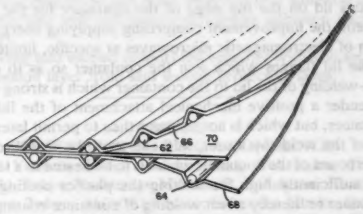
4,217,155
MULTI-PAIR CABLE HAVING LOW CROSSTALK

William B. Fritz, and John R. Hopkins, both of Hershey, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 685,828, May 13, 1976, Pat. No. 4,149,026, which is a continuation-in-part of Ser. No. 612,887, Sep. 12, 1975, abandoned. This application Nov. 16, 1978, Ser. No. 961,314

Int. Cl.² B32B *31/10*; H01B *13/06*

U.S. Cl. 156—55 **5 Claims**



1. A method of producing improved multiconductor cable having low crosstalk characteristics and suitable for use in balanced electrical systems, comprising the steps of:

forming a first web of insulation material;

bonding a first plurality of conductors assigned a first electrical function to said web in a fixed regular spaced parallel and essentially planar first array;

forming a second web of insulation material;

bonding a second plurality of conductors assigned a second electrical function to said second web in a like fixed regular spaced parallel and essentially planar second array;

securing said first and second webs together with an adhesive with the conductors aligned so as to form a plurality of pairs, including one conductor of said first array and one conductor of said second array, said conductors being essentially parallel to each other and spaced apart a distance such that the product of the capacitances between

adjacent first and adjacent second conductors of adjacent pairs approaches the product of the capacitances between adjacent first conductors and second conductors of adjacent pairs in order to provide an approximate balanced bridge condition to minimize crosstalk between pairs of conductors.

4,217,156

METHOD FOR SEALING A PLASTICS LID TO A CONTAINER OF PLASTICS-COATED PAPER BOARD AND APPARATUS FOR CARRYING OUT THE METHOD

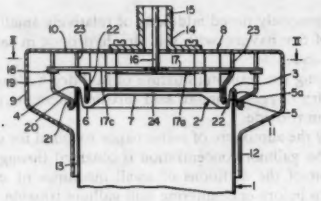
Svein Slungaard, Slemmestad; Tom Frydendal, Oslo, and Finn Skjelby, Spikkestad, all of Norway, assignors to Elopak A/S, Spikkestad, Norway

Filed Feb. 17, 1978, Ser. No. 879,944

Claims priority, application Norway, Feb. 18, 1977, 770558

Int. Cl.[2] **B29C** *27/04;* **B65B** *7/28*

U.S. Cl. 156—69 **8 Claims**



1. In a method for sealing a lid to a container, comprising in combination the following steps: providing a container having at least one wall and a bottom, said container being comprised of plastics-coated paperboard, the paperboard having a relatively high dielectric constant compared with the plastics of the layers coating the paperboard; providing a plastics lid with a circumference having a U-shaped groove with inner and outer flanges adapted to embrace the top edge of the container, the inner flange being bent inwardly at a right angle to a small horizontal portion merging into a raised center position, said plastics of the lid having a relatively low dielectric constant compared with the paperboard of the container: placing said plastics lid on the top edge of the container for the closing thereof; the improvement comprising supplying energy in the form of electromagnetic microwaves at specific, limited areas of the lid flanges which join the container so as to effect a spot-welding of the lid to the container which is strong enough to render a positive mechanical attachment of the lid to the container, but which is not stronger than to permit later breaking of the welds by a user, said energy to be absorbed in the paperboard of the container which is to be heated to a temperature sufficiently high for melting the plastics coating of the container to thereby effect welding of container coating to the lid flanges in the specific areas of the melted paperboard plastics coating.

4,217,157

METHOD OF FABRICATING FIBER-REINFORCED ARTICLES

Leon Stoltze, East Hartland, Conn.; Harry A. Nutter, Jr., Longmeadow, and Robert F. Wilson, Springfield, both of Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 20, 1978, Ser. No. 962,498

Int. Cl.[2] **B23P** *17/00;* **B30B** *15/06;* **B32B** *31/00;* **B01D** *47/00*

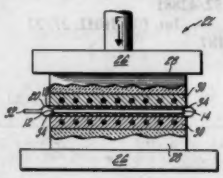
U.S. Cl. 156—87 **5 Claims**

1. A method for fabricating a consolidated fiber-reinforced metal matrix composite article comprising:

bonding a plurality of spaced filaments to one surface of a first metal foil with a fugitive binder, said filaments having their axes parallel and said foil having a plurality of apertures opening to the spaces between said filaments;

overlaying said filaments with a second metal foil to form a stack, said second foil having a plurality of apertures opening to said spaces between said filaments;

holding said stack in a vacuum die between a pair of corrugated flexible plates;



establishing a vacuum and temperature in said die sufficient to evaporate said fugitive binder to a gas, said gas being evacuated through said apertures and said corrugations; and

hot pressing said stack to flatten said plates and consolidate said stack.

4,217,158

METHOD OF FORMING PRESTRESSED FILAMENT WOUND PIPE

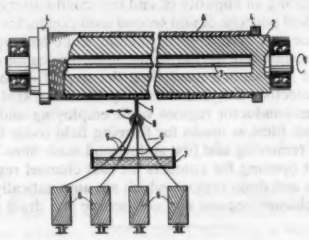
Alfred Puck, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,806

Claims priority, application Switzerland, Oct. 3, 1977, 12049/77; Oct. 18, 1977, 12676/77

Int. Cl.[2] **B65H** *81/00*

U.S. Cl. 156—156 **7 Claims**

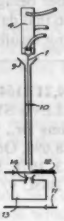


1. A method of manufacturing a glass fibre reinforced plastic pipe by winding a first resin impregnated pipe layer of glass fibres oriented approximately in the circumferential direction, setting the first pipe layer, subjecting the set first pipe layer to axial compressive pressure loading by an external force and to radial pressure loading by an internal pressure medium; forming a second resin impregnated pipe layer of glass fibres oriented approximately in the axial direction on the loaded first pipe layer, setting the second pipe layer, and removing the external force and the pressure medium after the second pipe layer has set.

4,217,159
LAYING ORIENTED FIBROUS WEBS

Peter M. Ellis, and Robert D. Gibb, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 16, 1978, Ser. No. 951,953
Claims priority, application United Kingdom, Oct. 26, 1977, 44537/77
Int. Cl.[2] D04H 3/04, 3/10, 3/12
U.S. Cl. 156—177 11 Claims



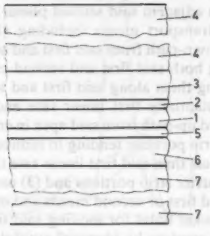
1. A process for the production of an ordered web from at least one fibrous strand, comprising forwarding a strand towards a moving collecting surface, imparting an oscillatory motion to the strand at a point above the collecting surface and passing the oscillating strand between two closely spaced plates which are substantially parallel to each other and to the plane of strand oscillation and which extend substantially from the place of oscillation down to the collecting surface whereon the strand is laid in substantially parallel successive lengths of the strand.

5. Apparatus for laying down a fibrous strand in substantially parallel courses comprising means for supplying a fibrous strand, means for forwarding the strand, means to impart an oscillatory motion to the forwarded strand and a collecting surface adapted to move relative to the strand oscillatory means and whereon the strand is laid and including two closely spaced plates which are substantially parallel to each other and to the plane of oscillation and which extend between the oscillating means and the collecting surface.

4,217,160
THIN POLARIZER FOR AN ELECTRO-OPTICALLY ACTIVATED CELL AND METHOD FOR MAKING SAME

Alain Perregaux, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 7, 1978, Ser. No. 958,362
Claims priority, application Switzerland, Dec. 16, 1977, 15491/77
Int. Cl.[2] B44C 1/20
U.S. Cl. 156—239 8 Claims



1. A method for producing an electro-optically activated cell having a thin polarization foil laminate applied to a cell plate by means of a first adhesion layer, comprising the steps of:

applying a first adhesion layer to a polarization foil which is attached to a first support foil, said first adhesion layer having a weaker adhesion action on the surface of said cell plate than on a masking foil to be later applied thereto;

applying said masking foil to said first adhesion layer;

removing said first support foil from said polarization foil;

applying a protective layer less than 50 μm thick to the side of said polarization foil opposite said masking foil;

applying a second support foil with a second adhesion layer to said protective layer with the second adhesion layer adhering to said protective layer, said second adhesion layer having a weaker adhesion action on said protective layer than on said second support foil;

removing said masking foil;

applying the composite lamination produced by the preceding step to the cell plate with said first adhesion layer contacting said cell plate and causing adhesion thereto, and

removing said second support foil together with said second adhesion layer from said protective layer.

5. A method for producing an electro-optically activated cell having a thin polarization foil laminate applied to a cell plate by means of a first adhesion layer, comprising the steps of:

applying a first protective layer less than 50 μm thick to a polarization foil which is attached to a first support foil;

applying a first adhesive layer to the first protective layer, said first adhesive layer having a weaker adhesive action on the surface of said first protective layer than on the surface of a masking foil to be later applied to said first adhesive layer;

applying said masking foil to said first adhesion layer;

removing said first support foil from said polarization foil;

applying a second protective layer less than 50 μm thick to the side of said polarization foil opposite said masking foil;

applying a second support foil with a second adhesion layer to said second protective layer with the second adhesion layer adhering to said second protective layer, said second adhesion layer having a weaker adhesion action on said second protective layer than on said second support foil;

removing said masking foil;

applying the composite lamination resulting after the preceding step to the cell plate with said first adhesion layer contacting said cell plate and causing adhesion thereto; and

removing said second support foil together with said second adhesion layer from said second protective layer.

4,217,161
PROCESS FOR MAKING A CONTAINER

Muneki Yamada, Ebina; Sadao Hirata, Yokohama; Jinichi Yazaki, Tokyo; Yoshitsugu Maruhashi, Yokohama; Kozaburo Sakano, Tokyo; Akira Kishimoto; Shunsaku Hirata, both of Yokohama; Toru Suzuki, Yokosuka, and Fumio Kano, Kamakura, all of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Division of Ser. No. 821,484, Aug. 3, 1977. This application Oct. 30, 1978, Ser. No. 955,614
Claims priority, application Japan, Aug. 10, 1976, 51-94533; Jul. 18, 1977, 52-85114
Int. Cl.[2] B29D 7/02
U.S. Cl. 156—242 6 Claims

1. A process for the preparation of containers which comprises forming a multi-layer structure comprising at least one layer composed of an oxygen-barrier thermoplastic resin having an oxygen permeability lower than 5.5×10^{-12} oc.cm/cm^2.sec.cmHg as measured at 37° C. and at least one layer comprising an orienting thermoplastic resin other than the oxygen-barrier thermoplastic resin by co-melt-extrusion, said two resins being selected so that the requirement represented by the following formula:

$$|T_B - T_O| \leq 35° \text{ C.} \quad (1)$$

wherein T_B stands for the melting or softening point (°C.) of said oxygen-barrier thermoplastic resin and T_O stands for the melting or softening point (°C.) of said orienting thermoplastic resin, is satisfied; and molding said multi-layer structure into a container at a molding temperature (Tm) satisfying the requirement represented by the following formula:

$$|Tm - T_B| \leq 30° \text{ C.} \quad (8)$$

wherein T_B is as defined above and Tm stands for the molding temperature (°C.), and under such conditions that orientation of the orienting thermoplastic resin is caused at least in a smallest-thickness portion of the container.

4,217,162

PROCESS FOR MAKING FORM SETS FROM CARBONLESS COPY PAPER SHEETS

Kenneth D. Glanz; William J. Becker, and Robert E. Miller, all of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Jul. 26, 1978, Ser. No. 928,105

Int. Cl.[2] B41L *1/24;* **B32B** *31/24, 7/12, 7/06*

U.S. Cl. 156—305 **7 Claims**

1. A process for making form sets from carbonless copy paper, comprising the steps of:

(a) applying to an edge of a stack of sheets of said copy paper an aqueous composition selected from the group consisting of water, aqueous solutions of inorganic salts, aqueous solutions of dyes and aqueous latex dispersions,

(b) drying said aqueous composition,

(c) applying an adhesive to said edge,

(d) drying said adhesive, and

(e) fanning said stack.

4,217,163

ADVANCING ARRANGEMENT WITH ADJUSTABLE STEPWISE ADVANCING DISTANCE

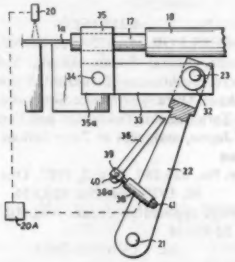
René Utzmann, Meuden, and Jean M. Dronet, Falaise, both of France, assignors to Sté d'Application Plastique, Mecanique et Electronique Plastimecanique S.A., Falaise, France

Filed Sep. 28, 1978, Ser. No. 946,599

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744280

Int. Cl.[2] B32B *31/00*

U.S. Cl. 156—361 **3 Claims**



1. In a heat forming machine having molding means and cutting and stamping means arranged successively in downstream fashion, and photocell means operatively mounted in said machine and adapted to scan the indicia on a foil band being transported through said heat forming machine;

an improved advancing arrangement for the stepwise advancing of the transported foil band having registration indicia along a predetermined path

said advancing arrangement including clamping means adapted to clampingly hold and release said foil band;

swing arm means pivotally mounted on said machine;

a first shaft mounted on the swing arm means in proximity of the free end thereof;

eccentric bearing means rigidly mounted on said first shaft;

an actuation lever rigidly secured to said first shaft; and

a lengthwise adjustable connecting member being pivotally connected at one end to said swing arm means and at the other end to said actuating lever, said lengthwise adjustable connecting member being operatively connected to said photocell means so that its length is adjusted in accordance with the scanning results thereof.

4,217,164

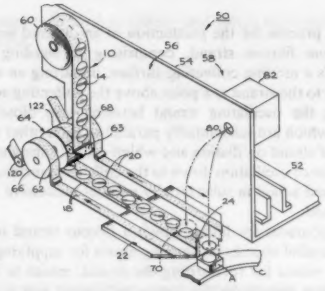
LABELLING SYSTEM

Herbert La Mers, 2317 Palma Dr., Ventura, Calif. 93003

Continuation of Ser. No. 618,690, Oct. 1, 1975, abandoned. This application Jan. 3, 1978, Ser. No. 866,455

Int. Cl.[2] B65C *9/18, 9/36*

U.S. Cl. 156—541 **15 Claims**



1. Apparatus for automatically sequentially applying labels to objects, said apparatus comprising:

a label strip having sprocket holes there along separated from one another by a unit spacing, said label strip including first and second parallel carrier strip portions and a plurality of labels adhered along said strip so as to bridge said carrier strip portions, each label being uniformly positioned with respect to one of said sprocket holes;

a plate having first and second substantially planar surfaces and an edge lying substantially in the plane of said plate:

said plate edge including a V-shaped region extending into said plate comprised of first and second edge portions converging toward the apex of said V-shaped region;

strip transport means for moving said label strip along a first path extending substantially contiguous with said first planar surface toward said apex and then along first and second branch paths respectively extending around said first and second edge portions and thence in diverging direction adjacent said second planar surface;

said strip transport means including (1) first means positioned down-path from said first and second edge portions engaging both said first and second carrier strip portions for pulling them along said first and second branch paths at a substantially first linear rate and (2) second means positioned up-path from said apex in engagement with said carrier strip portions tending to reduce their rate of movement to less than said first linear rate thus creating tension in said carrier strip portions and (3) means associated with either said first or second means and operatively engaging said sprocket holes for moving said first and second carrier strip portions by identical multiples of said unit spacing to thus prevent any cumulative differential linear movement between said carrier strip portions; and

label-applying means operable to engage labels immediately

adjacent to said apex as said carrier strip portions are simultaneously separated from each other and from said labels and to press said engaged labels against objects to be labelled.

4,217,165

METHOD OF GROWING A RIBBON CRYSTAL PARTICULARLY SUITED FOR FACILITATING AUTOMATED CONTROL OF RIBBON WIDTH

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Theodore F. Ciszek, Salt Point, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,055

Int. Cl.[2] B01D *9/00*; B01J *17/18*

U.S. Cl. 156—601 **1 Claim**

1. In a method for growing a ribbon crystal at a growth region extending between opposite side edge portions and defined along a solid/liquid interface for a meniscus of molten silicon attached to a crystal as the meniscus is lifted from a graphite crucible and cooled by streams of inert gas directed to impinge on the growth region, said crystal being solidified at a rate determined by the rate at which the crystal is lifted, the intensity of heat applied thereto and the flow rate for the inert gas, said growth region being characterized by a brightness the intensity of which is inversely related to the temperature thereof the improvement comprising:

A. continuously monitoring the intensity of the brightness of the growth region at its opposite edge and center portions for detecting changes in the temperatures thereof;

B. varying the flow rate for the streams of gas impinging on the side edge portions of the growth region inversely with detected changes in the intensity of the brightness thereof, while simultaneously varying the intensity of the heat applied thereto directly with detected changes in the intensity of the brightness of the growth region; and

C. varying the rate at which the meniscus is lifted directly with respect to detected changes in the intensity of the brightness of the portion of the growth region located between the side edge portions, while simultaneously varying the intensity of the heat applied thereto inversely with respect to detected changes in the intensity of the brightness thereof.

4,217,166

PROCESS FOR THE PRODUCTION OF LITHIUM FLUORIDE DETECTORS

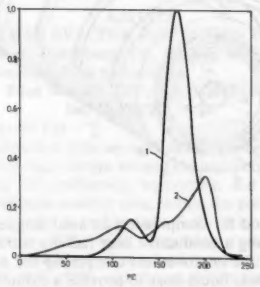
Reinhard Nink, Berlin, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,344

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1976, 2644435

Int. Cl.[2] B01J *17/34*

U.S. Cl. 156—605 **10 Claims**



1. A process for the production of a lithium fluoride detector for thermoluminescence dosimetry comprising a lithium fluoride monocrystal doped with one or more foreign substances from a melt, by using lithium fluoride powder with only titanium added to it as the starting material for the production of the monocrystal and incorporating oxygen into the crystal lattice at least during production of the crystal.

4,217,167

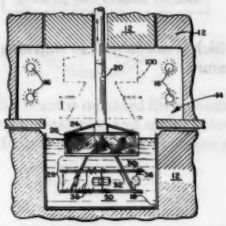
METHOD OF GROWING LARGE LOW DEFECT, MONOCRYSTALS OF BEO

Stanley B. Austerman, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1977, Ser. No. 864,967

Int. Cl.[2] B01J *17/04*

U.S. Cl. 156—624 **16 Claims**



14. A method for forming a large mono crystalline, twin-free, BeO crystal comprising:

(a) growing a monocrystalline BeO parent crystal having an axial inversion twin core wherein at least part of said parent crystal is grown in a flux melt formed from about 10 to 50 weight percent K_2CO_3, about 90 to 50 weight percent MoO_3, 0.001–0.1 weight percent SiO_2 and 0.001–0.1 weight percent of materials selected from the group consisting of $K_2Cr_2O_7$, MgO, Al_2O_3, CaO and Fe_2O_3; and

(b) deriving an inversion-twin-free BeO monocrystal from said parent BeO crystal.

4,217,168

MAGNETIC CORE FORMED FROM LAMINATIONS

Peter C. Ridgway, Staines, and Derek F. Case, Sunbury, both of England, assignors to Data Recording Instruments Limited, Staines, England

Filed Sep. 14, 1978, Ser. No. 942,155

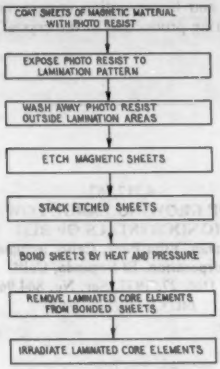
Claims priority, application United Kingdom, Sep. 16, 1977, 38569/77

Int. Cl.[2] C23F *1/02*; B44C *1/22*; H01F *3/02, 41/02*

U.S. Cl. 430—320 **6 Claims**

1. A method of manufacturing a laminated magnetic core for operation at temperatures up to a predetermined temperature including the steps of providing a plurality of laminations of magnetic material; forming a film of a co-polymer on said laminations; said co-polymer being subject to softening at said predetermined temperature; assembling a stack of the laminations with the films of co-polymer interposed between said laminations and causing the films to bond the laminations together; and then subjecting the bonded stack to the effects of

high energy radiation to produce a change in the co-polymer effective to result in the production of a material bonding the


COAT SHEETS OF MAGNETIC MATERIAL WITH PHOTO RESIST
EXPOSE PHOTO RESIST TO LAMINATION PATTERN
WASH AWAY PHOTO RESIST OUTSIDE LAMINATION AREAS
ETCH MAGNETIC SHEETS
STACK ETCHED SHEETS
BOND SHEETS BY HEAT AND PRESSURE
REMOVE LAMINATED CORE ELEMENTS FROM BONDED SHEETS
IRRADIATE LAMINATED CORE ELEMENTS

laminations which is not subject to softening at said predetermined temperature.

4,217,169

METHOD OF MANUFACTURING FIBROUS SHEET MATERIAL

Sergei V. Baburin, poselok Pravdinsky, ulitsa Zhdanova, 19, kv. 26; Vladimir A. Gorbushin, poselok Khotkovo, Turisticheskaya ulitsa, 13, kv. 19; Alexandr P. Muraviev; Valery N. Nepein, both of poselok Pravdinsky, Institutsky proezd, 1, all of Moskovskaya oblast; Mikhail V. Frolov, Varshavskoe shosse, 16, kv. 235, Moscow; Sergei A. Aizenberg, ulitsa Dmitrova, 11/67, kv. 136, Leningrad; Evgeny H. Golovko, Krasnoputilovskaya ulitsa, 28/29, kv. 58, Leningrad; Alexandr F. Kamenev, Bukharestskaya ulitsa, 7, kv. 232, Leningrad, and Igor A. Sergeev, prospekt Stachek, 27, kv. 8, Leningrad, all of U.S.S.R.

Continuation of Ser. No. 784,595, Apr. 4, 1977, abandoned, which is a continuation of Ser. No. 640,341, Dec. 12, 1975, abandoned. This application Nov. 1, 1978, Ser. No. 956,445

Int. Cl.[2] D21D *3/00*

U.S. Cl. 162—100 **1 Claim**

1. A method of manufacturing fibrous sheet materials from moist fibrous raw materials including the following operations: providing a suspension of fibrous material with a fiber concentration of 5–30 wt.-% in moist fibrous raw material; heating said suspension to 102°–145° C. under a pressure of 1.1–4.0 atm abs, delivering the heated suspension as a steam-air stream into a moulding chamber, reducing rapidly the pressure in the stream in the moulding chamber to 0.8–1.0 atm abs within a period of 10^{-1}–10^{-3} seconds to effect a rapid rate of dispersion of the fibers in a steam-air medium in the chamber with a simultaneous formation of an air-material mixture and uniform distribution of fibers sufficiently finely distributed in said mixture to alternatively make a sheet of cardboard or paper therefrom, moulding the fibers in the moulding chamber into a sheet of fibrous material free of binder material on a moving screen in the moulding chamber by settling the fibers from the air-material mixture under control of a pressure difference above and under the screen, compacting mechanically the settled fibrous sheet, and drying the sheet of fibrous material.

4,217,170

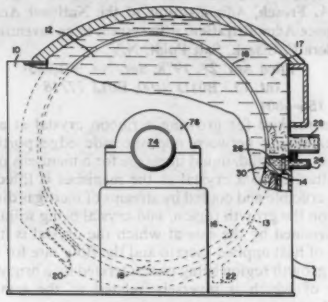
PULP WASHER DISCHARGING A LOW CONSISTENCY PULP SLURRY

Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 852,907, Nov. 18, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,095

Int. Cl.[2] D21C *9/06*

U.S. Cl. 162—380 **2 Claims**



1. A pulp washer comprising: a rotatable cylinder; a substantially air tight vat completely enclosing said rotatable cylinder; means for feeding a pulp slurry into said vat and partially along said rotatable cylinder; means for discharging a low consistency pulp slurry from the vat; means directly following the means for feeding the pulp slurry partially along said rotatable cylinder for forming and compacting the pulp slurry to form a mat of high consistency; a liquid filled wash chamber extending at least from the forming and compaction means to the means for discharging the low consistency pulp slurry; and means for applying a differential pressure across the circumferential wall of the rotatable cylinder to wash the mat with the liquid in the wash chamber.

4,217,171

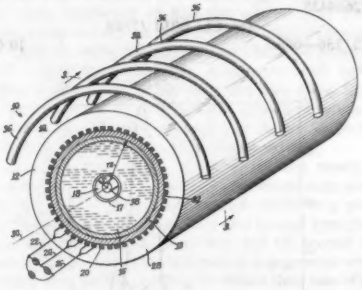
BLANKET DESIGN FOR IMPLODING LINER SYSTEMS

Michael J. Schaffer, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 15, 1977, Ser. No. 824,558

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—7 **7 Claims**



1. In a method for compressing an axial magnetic field by rapidly imploding a conductive liner radially surrounding the magnetic field, the improvement comprising the steps of

rotating a thick, liquid liner to provide a cylindrical vortex zone for said axial magnetic field along the axis of the liner, said liner having an inner, conductive, flux-trapping liquid metal layer adjacent the vortex zone, an intermedi-

ate molten salt layer radially outward from said flux-trapping layer, and an outer layer of a denser electrically conductive liquid metal, each of said layers being substantially immiscible with each of said layers adjacent thereto, rapidly imploding said stratified liquid liner by compressing said dense liquid metal outer layer and transmitting said compression forces to said flux trapping layer through said molten salt layer to compress said axial magnetic field.

4,217,172

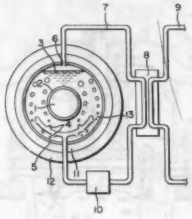
COOLANT SYSTEM AND COOLING METHOD UTILIZING TWO-PHASE FLOW FOR NUCLEAR FUSION REACTOR

Yasuo Mori, and Kunio Hijikata, both of Tokyo, Japan, assignors to Tokyo Institute of Technology, Tokyo, Japan

Continuation of Ser. No. 637,845, Dec. 5, 1975, abandoned. This application Oct. 13, 1977, Ser. No. 841,981

Int. Cl.[2] G21B *1/00*

U.S. Cl. 176—9 **2 Claims**



1. A heat generation and transfer system, comprising:

a container of generally cylindrical cross-section surrounded by a vacuum wall;

a source of energetic neutrons within said container, said neutrons penetrating said vacuum wall;

a coolant blanket surrounding said container, the space between said wall and blanket being substantially filled with a relatively stationary mass of liquid metallic lithium heated by absorption of said neutrons;

means outside said blanket for generating a strong magnetic field within said blanket, said field impeding flow of said liquid lithium;

means including an inlet conduit for introducing bubbles of gaseous helium into said lithium mass and for directing said bubbles for relative movement through said mass toward said vacuum wall and said coolant blanket;

means including an outlet conduit for removing heated gaseous helium from said space between said vacuum wall and said coolant blanket; and

means for extracting heat from said heated gaseous helium.

4,217,173

NUCLEAR REACTOR INSPECTION DEVICE

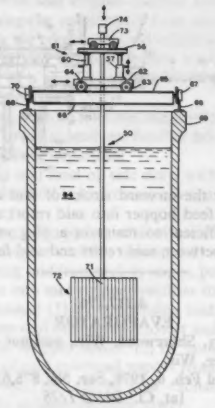
Felix S. Jabsen, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 21, 1977, Ser. No. 853,074

Int. Cl.[2] G21C *17/00*

U.S. Cl. 176—19 LD **2 Claims**

1. In combination with an open ended nuclear reactor pressure vessel having a flange around the top periphery thereof, an apparatus for positioning, supporting, and longitudinally aligning a radiation scanner tube, within the pressure vessel, in direct contact with an end cap of a fuel rod in a fuel assembly having a plurality of fuel rods, comprising: a track mounted on the flange; a main brace; first wheel means, operatively connected to the ends of the main brace, for transversely moving the main brace along the track relative to a longitudinal axis in a first direction; second wheel means, engaging the main brace, operatively connectd to a frame, for transversely positioning the frame along the length of the main brace relative to the longitudinal axis in a second direction which is perpendicular to the first direction; a hydraulic cylinder, mounted on the



frame, upon which a brace is mounted for movement therewith parallel to the longitudinal axis; and spring means for biasing the scanner tube from the brace, in a direction parallel to the longitudinal axis.

4,217,174

MANUFACTURE OF NUCLEAR FUEL COMPACTS

David F. Leary, San Diego; Roy G. Cooper, Rancho Santa Fe, and Gary N. Miertschin, San Diego, all of Calif., assignors to General Atomic Company, San Diego, Calif.

Division of Ser. No. 510,390, Sep. 30, 1974, Pat. No. 4,064,204. This application Dec. 8, 1977, Ser. No. 858,677

Int. Cl.[2] G21C *21/02*

U.S. Cl. 176—82 **4 Claims**

1. A matrix suitable for preparing nuclear fuel rods below 300° said matrix comprising graphite flour, pitch and an additive, said additive being selected from saturated and unsaturated alcohols having a carbon chain length of from 12 to 20, saturated and unsaturated fatty acids having a carbon chain length of from 12 to 20, saturated and unsaturated primary amines derived from fatty acids having a carbon chain length of from 12 to 20 and saturated hydrocarbons derived from petroleum having a molecular weight in the range of from about 350 to about 1400 said additive being present at a level of from about 2 to about 12 percent by weight of said matrix, said graphite flour being present at a level of from about 25 to about 45 percent, by weight of said matrix, and said pitch being present at a level of from about 43 to 73 percent by weight of said matrix.

4,217,175

APPARATUS FOR SOLID WASTE PYROLYSIS

Bertram B. Reilly, 17 Briar Cliff Rd., Pittsburgh, Pa. 15202

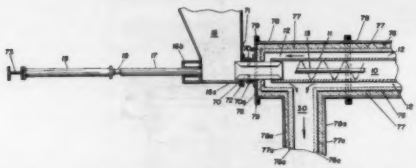
Filed Apr. 28, 1978, Ser. No. 900,983

Int. Cl.[2] C10B *7/10, 47/18, 53/02*; F23K *3/00*

U.S. Cl. 202—118 **4 Claims**

1. In municipal waste pyrolysis systems having a feed hopper for shredded municipal waste with a discharge opening adjacent the bottom thereof and an indirectly heated pyrolysis retort having a raw material inlet at one end thereof connected to said discharge opening of said feed hopper, the improvement comprising: a tubular nozzle concentric with the axis of said retort extending from the bottom of said feed hopper into said retort, said nozzle having an inwardly tapered entrance and comprising said discharge opening of said feed hopper and also said raw material inlet of said retort: a variable stroke

reciprocating ram mounted to traverse the bottom of said feed hopper in a direction co-axial with said nozzle, and means for adjusting the length of the stroke of said ram towards said



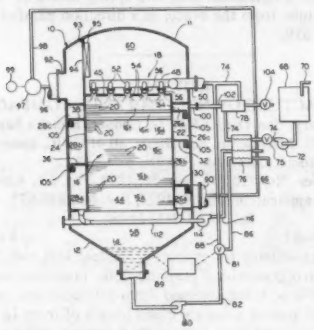
nozzle, whereby the forward stroke of said ram forces said waste from said feed hopper into said retort at an adjustable variable rate sufficient to maintain a plug of said waste in sealing relation between said retort and said feed hopper.

4,217,176

EVAPORATOR

Arthur P. Antony, Shorewood, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Feb. 6, 1978, Ser. No. 875,618
Int. Cl.[2] B01D *1/28*
U.S. Cl. 202—173 **13 Claims**



1. An evaporator including:

a generally vertically oriented vessel having a longitudinal axis,

heat exchange means disposed within said vessel and intermediate the ends thereof and including a plurality of generally horizontally extending heat exchange tubes and a pair of tube sheet means arranged in spaced relation for supporting said heat exchange tubes,

a plurality of partition means disposed adjacent said heat exchange tubes and engaging with said tube sheet means for defining an evaporating space, said heat exchange tubes extending through said evaporating space,

said heat exchange means being spaced from the upper and lower ends of said vessel to define a first vapor collecting space in said vessel above said heat exchange means and a second vapor collecting space in said vessel below said heat exchange means,

said tube sheet means and said partition means being spaced from said vessel and defining therewith a plurality of continuous and spaced apart vapor passages extending generally vertically, the opposite ends of said heat exchange tubes extending between first and second ones of said passages and at least one additional vapor passage extending between and interconnecting said vapor spaces,

said partition means isolating said first and second passages from said vapor spaces,

a plurality of baffles disposed in each of said first and second passages, the baffles in each passage being arranged in a vertically staggered relation one to the other and at different elevations than those of the other whereby the heat exchange tubes are divided into groups with the inlet and outlet ends of the tubes of adjacent groups isolated so that the vapor is routed back and forth through adjacent groups of said heat exchange tubes,

cover means disposed above said evaporating space for separating the same from said first vapor collecting space,

a feed liquid distributor disposed above said heat exchange means for distributing feed liquid downwardly over said heat exchange tubes,

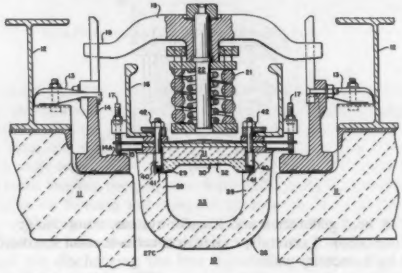
a vapor inlet connected to one of said first and second passages and a vapor outlet connected to said first vapor collecting space.

4,217,177

VENTED COKE OVEN DOOR APPARATUS

Charles C. Gerding, and Harry B. Brown, Jr., both of Pittsburgh, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Dec. 5, 1978, Ser. No. 966,848
Int. Cl.[2] C10B *25/06*
U.S. Cl. 202—248 **9 Claims**



1. A vented coke oven door apparatus for a coke oven chamber to form a removable end closure to the coke oven refractory and relieve the pressure of coke oven gas generated at the bottom of a coal charge in the coke oven chamber, said vented coke oven door assembly including the combination of:

a door frame having a vertically-extended height substantially corresponding to the height of a coke oven chamber,

a plug assembly defining a vertical internal passageway while supported by said door frame along one vertical face surface thereof to project into a coke oven chamber for conducting coke oven gas from the bottom portion of the coke oven chamber to the top portion thereof, said plug assembly including a plurality of U-shaped refractory plug segments arranged in an end-to-end aligned relation with leg sections of each U-shaped segment extending to the vertical face surface of the door frame, said plug assembly further including a back-plug means spanning the distance between the leg sections of the plug segments while extending along the door frame to thermally protect the door frame from contact with coke oven gas flowing along the vertical internal passageway of the plug assembly,

a fastener extending between said door frame and each leg section of the U-shaped refractory plug segments, each of said refractory plug segments being supported by a fastener engaged with each leg section of the "U" shape to permit movement of the leg sections toward and away from each other due to thermal expansion in response to a thermal gradient across the wall of each refractory plug segment,

seal means extending around the outer periphery of said door frame to prevent the emission of coke oven gas from the coke oven chamber, and

latch means carried by said door frame for support thereof.

4,217,178

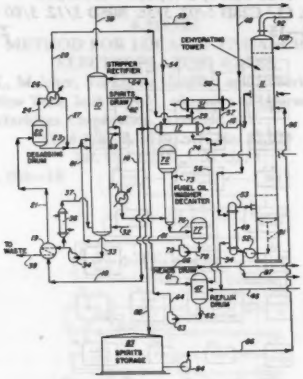
DISTILLATION SYSTEM FOR MOTOR FUEL GRADE ANHYDROUS ALCOHOL

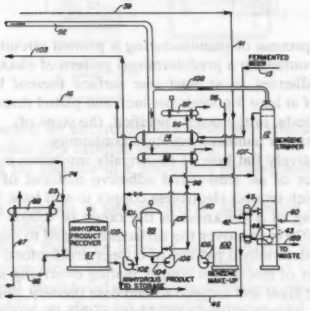
Raphael Katzen; George D. Moon, Jr., and Jimmy D. Kumana, all of Cincinnati, Ohio, assignors to Raphael Katzen Associates International, Inc., Cincinnati, Ohio

Filed Nov. 7, 1978, Ser. No. 958,533

Int. Cl.[2] B01D *3/36*

U.S. Cl. 203—19 **6 Claims**





1. In a distillation system for recovering anhydrous ethanol from a dilute feedstock wherein the feedstock is introduced into a stripper-rectifier tower, a concentrated ethanol stream is removed from said stripper-rectifier tower and introduced into a dehydrating tower, an azeotropic agent is also introduced into said dehydrating tower, a substantially azeotropic composition is removed overhead from said dehydrating tower, an anyhydrous ethanol product is recovered from the bottom portion of said dehydrating tower, the azeotropic overhead from said dehydrating tower is condensed and separated into an upper phase rich in azeotropic agent and a lower water-rich phase, the upper phase is returned to said dehydrating tower, and the lower water-rich phase is introduced into a stripper tower wherein the azeotropic agent is recovered and returned to the system;

the improvement which comprises the steps of:

(a) maintaining a higher pressure in said stripper-rectifier tower than in said dehydrating tower and said stripper tower;

(b) removing overhead vapors, including lower boiling impurities, from said stripper-rectifier tower;

(c) condensing first and second portions of said overhead vapors from said stripper-rectifier tower to supply the heat required in said dehydrating tower and said stripper tower;

(d) condensing at least a third portion of said overhead vapors from said stripper-rectifier tower;

(e) combining the condensates from steps (c) and (d) and returning the combined condensates as reflux to the top portion of said stripper-rectifier tower, except for the removal of a small heads draw containing said lower boiling impurities;

(f) removing from an intermediate portion of said stripper-rectifier tower at least one fusel oil side draw containing higher boiling impurities;

(g) washing said fusel oil side draw with water, and separating a fusel oil layer from an aqueous ethanol-containing layer;

(h) returning said aqueous ethanol-containing layer as feed to said stripper-rectifier tower; and

(i) preheating said feedstock in stages, prior to introducing the same into said stripper-rectifier tower, by means of heat obtained (1) by condensing said azeotropic overhead from said dehydrating tower and overhead vapors from said stripper tower, (2) by condensing said third portion of said overhead vapors from said stripper-rectifier tower, and (3) by heat exchange with bottoms from said stripper-rectifier tower.

4,217,179

DETERMINATION OF LITHIUM, SENSOR THEREFOR AND METHOD OF MAKING SAID SENSOR

Derek J. Fray, Cambridge, England, assignor to National Research Development Corporation, London, England

Filed Jul. 3, 1979, Ser. No. 54,579

Claims priority, application United Kingdom, Jul. 17, 1978, 30028/78

Int. Cl.[2] G01N *27/58*

U.S. Cl. 204—1 T **13 Claims**

1. Apparatus in the form of a probe for determining the lithium content of a substance by monitoring the e.m.f. generated between the substance and a reference material containing lithium, the substance and reference being separated from one another by a solid electrolyte which is electrically conductive to lithium ions, in which the probe contains the reference material and separates the reference material from the substance with said solid electrolyte when the probe is introduced thereto, and in which the solid electrolyte of the probe comprises β-spodumene.

8. A process for the production of apparatus according to claim **1**, in which a pellet of β-spodumene is fabricated in situ in the end of a tube of refractory material to provide a tubular probe.

12. A process for the determination of lithium present in a substance, which comprises determining the e.m.f. generated between the substance and a reference material containing

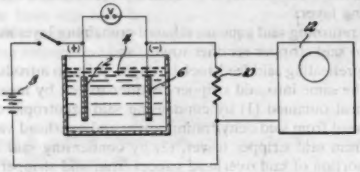
lithium, in which the reference material and substance are separated by a solid electrolyte comprising β-spodumene.

4,217,180

METHOD OF DETERMINING SUSCEPTIBILITY OF ALLOYS TO STRESS CORROSION CRACKING

William J. Baxter, Bloomfield Hills, Mich., and David R. Arnott, North Rockhampton, Australia, assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 17, 1979, Ser. No. 58,138
Int. Cl.[2] G01N *27/42, 3/08*
U.S. Cl. 204—1 T **1 Claim**



1. A testing method for determining the susceptibility of alloys to stress corrosion cracking comprising the steps of:

anodizing the surfaces of samples of said alloys at a predetermined potential in an appropriate electrolyte to form current-limiting oxide coatings thereon;

straining the samples to a predetermined level sufficient to induce the formation of microcracks in said coatings;

reanodizing said samples in said electrolyte at a potential of about said predetermined anodizing potential or less until the reanodization current decays from an initial value to a predetermined fraction of said initial value;

determining the times required to perform said reanodizations; and

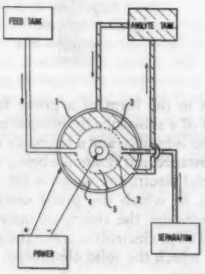
comparing the reanodization time per unit area of each sample with the reanodization times per unit area of the other samples as an indicator of the relative susceptibility of the samples to stress corrosion cracking.

4,217,181

RECOVERY OF URANIUM OXIDES BY ELECTROLYSIS

William R. Gurr, Berkshire, England, assignor to National Research Development Corporation, London, England

Filed Jun. 9, 1978, Ser. No. 914,223
Int. Cl.[2] C25C *1/22*
U.S. Cl. 204—1.5 **7 Claims**



1. A method of extracting uranium oxide from a solution of uranium compounds comprising the steps of:

(a) providing a solution of uranium compounds,

(b) subjecting said solution to electrolysis utilizing a high current density from about 500 to about 4000 amp/m^2 wherein the electrolysis is conducted in a rotating cathode cell, whereby uranium oxide is formed at the cathode, and

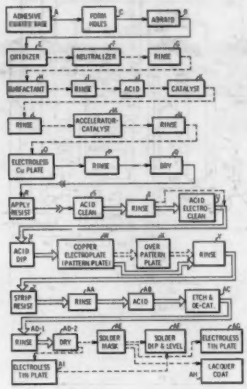
(c) recovering the uranium oxide.

4,217,182

SEMI-ADDITIVE PROCESS OF MANUFACTURING A PRINTED CIRCUIT

Joseph E. Cross, Springfield, Mo., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jun. 7, 1978, Ser. No. 913,281
Int. Cl.[2] C25D *5/02, 5/56;* B05D *5/12, 3/00*
U.S. Cl. 204—15 **27 Claims**



1. The process of manufacturing a printed circuit board of the type containing a predetermined pattern of electrical conductors adherent to at least one surface thereof by a peel strength of at least 8 pounds per inch and plated through-holes which include, in the order specified, the steps of:

(a) forming a laminate structure containing:

a relatively flat base of electrically insulative material;

a layer of an semi-cured adhesive material of the type which secures electroless copper to said base, said layer being of a thickness in the range of 0.0005 inches to 0.0020 inches over the surfaces intended to support said predetermined pattern of copper conductors;

a layer of electroless copper plating overlying said adhesive layer and secured to said base thereby, said electroless copper having a thickness within the range of 15 to 50 millionths of an inch; and

a plurality of passages through said laminate structure and said layers containing passage walls covered by electroless copper connected to said layer of electroless copper;

(b) securing a resist material over the surfaces of said structure in the negative image of the predetermined copper conductor pattern intended to be supported thereon, leaving exposed portions of said electroless copper in the positive image of the desired conductor pattern, said resist material being of a substance that is alkaline strippable;

(c) applying an acid solution to said resist covered laminate structure for cleaning said structure;

(d) immersing said laminate structure in an acid based copper electroplating solution and electroplating copper onto the exposed electroless copper for a duration sufficient to deposit electroplated copper of a thickness within the range of 0.0005 inches to 0.005 inches;

(e) applying an alkaline stripper solution to said plated laminate structure containing said electroplated copper for removing said resist material to uncover said electroless copper whereby an embossed pattern of metal is presented;

(f) applying an etchant solution to said laminate structure for

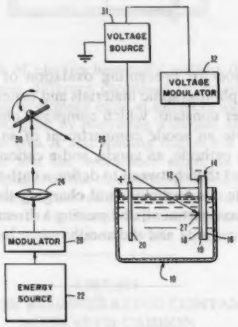
a predetermined interval to remove said uncovered electroless copper and thereby expose underlying portions of said adhesive layer without removing significant amounts of said electroplated copper;

whereby a circuit board containing a predetermined copper conductor pattern and plated through-holes is formed.

4,217,183
METHOD FOR LOCALLY ENHANCING ELECTROPLATING RATES

Robert L. Melcher, Yorktown Heights, and Robert J. von Gutfeld, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 8, 1979, Ser. No. 37,075
Int. Cl.[2] C25D *5/02, 5/16*
U.S. Cl. 204—15 **15 Claims**



1. A method for electroplating a metal onto selective regions of the surface of a cathode comprising:

placing the cathode in a non-photo decomposable electrolyte;

placing an anode in said electrolyte and spaced apart from said cathode;

directing a focusable beam of energy having an intensity between about 10^2 W/cm^2 and 10^6 W/cm^2 to heat said regions of said surface to be preferentially plated; and

establishing an electrical potential between said anode and said cathode while said surface is heated by said energy beam to preferentially electroplate metal on said region.

4,217,184
CONTINUOUS PROCESS FOR PREPARING METAL ALKOXIDES

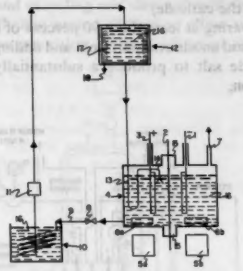
Mark A. Kuck, Upper Montclair, N.J., and Gary K. Miller, Port Chester, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 26, 1979, Ser. No. 23,985
Int. Cl.[2] C25B *3/12, 15/08*
U.S. Cl. 204—59 QM **8 Claims**

1. In a process for the production of a metal alkoxide in an electrochemical cell fitted with a membrane separator between anolyte and catholyte by passing electrical current through an alcoholic electrolyte between a sacrificial anode and a cathode, wherein the metal alkoxide is precipitated from the electrolyte, the improvement comprising the steps of:

(a) continuously removing a slurry of solid metal alkoxide and alcoholic liquid electrolyte from the cell;

(b) separating solid metal alkoxide from the alcoholic liquid electrolyte; and



(c) returning the clarified alcoholic liquid electrolyte back to the electrochemical cell.

4,217,185
ELECTROLYTIC PRODUCTION OF CERTAIN TRICHLOROPICOLINIC ACIDS AND/OR 3,6-DICHLOROPICOLINIC ACID

Demetrios Kyriacou, Clayton; Fred Y. Edamura, Concord, and Jim Love, Walnut Creek, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 2, 1979, Ser. No. 54,130
Int. Cl.[2] C25B *3/04, 11/04*
U.S. Cl. 204—73 R **15 Claims**

1. A process of electrolytic reduction in which a chlorine substituent in the 4- or 5-position of a polychloropicolinic acid which is tetrachloro-, 3,4,6-trichloro- or 3,5,6-trichloro-2-picolinic acid, is replaced with a hydrogen, said process comprising passing a direct, electrical current to a cathode from an anode through a stirred, basic aqueous solution of said picolinic acid, said cathode having a surface layer of silver microcrystals formed by the electrolytic reduction of colloidal, hydrous, silver oxide particles in the presence of an aqueous base.

4,217,186
PROCESS FOR CHLORO-ALKALI ELECTROLYSIS CELL

Wayne A. McRae, Zurich, Switzerland, assignor to Ionics Inc., Watertown, Mass.

Division of Ser. No. 942,109, Sep. 14, 1978, Pat. No. 4,173,524. This application Apr. 2, 1979, Ser. No. 26,268
Int. Cl.[2] C25B *1/34*
U.S. Cl. 204—98 **5 Claims**

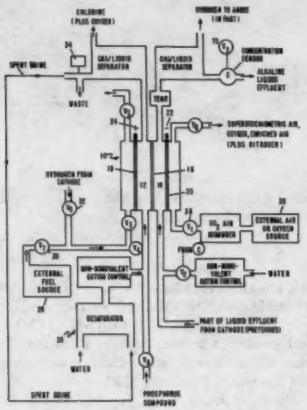
1. In the process for manufacturing caustic and chlorine which comprises recycling as an anolyte feed solution a substantially saturated aqueous alkali metal chloride solution into the anode compartment of a cell, said cell having an anode compartment containing an anode, a cathode compartment containing a cathode which is catalytic for the reduction of oxygen and a substantially fluid impermeable, cation permselective fluorocarbon membrane separating said anode and cathode compartments, passing a direct electric current between said anode and said cathode and recovering elemental chlorine from said anode compartment substantially equivalent chemically to the alkali recovered from said cathode compartment, the improvement which comprises:

(a) contacting said cathode with a quantity of a substantially carbon dioxide free gas selected from the group consisting of oxygen, air and mixtures thereof, which quantity is substantially more than that chemically equivalent to the amount of direct current passed;

(b) maintaining the liquid immediately effluent from said cathode compartment at a concentration of at least about 8 percent by weight and at a temperature of at least about

70° C. thereby readily causing said gas to react with water at said catalytic cathode to produce hydroxide ions and to substantially completely inhibit the formation of hydrogen gas at the cathode;

(c) recovering at least about 90 percent of the liquid effluent from said anode compartment and adding water and alkali chloride salt to produce a substantially saturated brine solution;



(d) adjusting the concentration of any non-monovalent metallic cation in said saturated brine solution to a concentration of not more than about 5 parts per million thereby producing said anolyte feed solution;

(e) maintaining the pH of the liquid effluent from said anode compartment in the range of from about 2 to about 4 thereby controlling the formation of chlorate in the anode compartment.

4,217,187

OPERATION OF ELECTROLYTIC DIAPHRAGM CELLS UTILIZING INTERRUPTABLE OR OFF-PEAK POWER

Lewis E. Tufts, Lewiston, N.Y., and Bernardus J. Mentz, Maple Ridge, Canada, assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 17, 1979, Ser. No. 39,998
Int. Cl.² C25B *1/34*
U.S. Cl. 204—98 **9 Claims**

1. A method of operating a plurality of electrolytic diaphragm cells for the electrolysis of alkali metal halides utilizing electrical current varying from a higher level to a lesser level and subsequently increasing to a selected higher level which comprises the steps of:

(a) reducing the amount of brine feed into each cell in an amount at least about proportional to a scheduled electrical load reduction,

(b) reducing the electrical load from said higher level to a lower level over a time period of not less than about 20 minutes,

(c) operating such cells at such lower electrical load level until additional current is available, and, when additional current is available,

(d) increasing the brine feed into each cell to between about 100 and about 150 percent of the original feed rate,

(e) increasing the electrical load level to said selected high level over a period of not less than about 10 minutes,

(f) adjusting the brine feed to the original feed rate, and

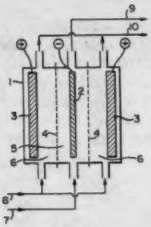
(g) maintaining the caustic concentration leaving the cell diaphragms during steps (a) through (f) to at least about 90 grams per liter.

4,217,188

METHOD FOR STORING DEVELOPERS

Takezo Ono, Mihara, Japan, assignor to Teijin Ltd., Japan

Division of Ser. No. 606,610, Aug. 21, 1975, Pat. No. 4,089,760.
This application Nov. 4, 1977, Ser. No. 848,782
Claims priority, application Japan, Aug. 30, 1974, 49-98922; Jan. 24, 1975, 50-9814; Feb. 26, 1975, 50-22800
Int. Cl.² C25B *3/04*
U.S. Cl. 204—109 **2 Claims**



1. A method for preventing oxidation of a developer for silver halide photographic materials and maintaining the pH of said developer constant, which comprises charging a solution of an acid into an anode compartment of an electrolytic cell comprising a cathode, an anode, and a cation exchange membrane disposed therebetween to define a cathode compartment and the anode compartment; and charging the developer into the cathode compartment; and passing a direct electric current between the cathode and the anode.

4,217,189

METHOD AND APPARATUS FOR CONTROL OF ELECTRO-WINNING OF ZINC

Robert C. Kerby, Rossland, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed Jun. 26, 1979, Ser. No. 52,921
Claims priority, application Canada, Jul. 5, 1978, 306805
Int. Cl.² C75C *1/16*
U.S. Cl. 204—119 **24 Claims**

1. A method for controlling a process for the recovery of zinc from a zinc sulfate electrowinning solution containing concentrations of impurities, said method comprising the steps of

(a) establishing a test circuit comprising a test cell, a sample of electrowinning solution, a cathode, an anode and a reference electrode, said electrodes being immersed in said sample, a variable voltage source and measuring means electrically connected to said electrodes;

(b) applying a potential to the electrodes in said test cell to obtain a predetermined potential between said cathode and said reference electrode;

(c) decreasing the potential from said predetermined potential at a constant rate at substantially zero current;

(d) measuring the decreasing potential;

(e) terminating said decreasing of said potential at a value which corresponds to the point at which zinc starts to deposit on the cathode and the measured current increases rapidly from a value of substantially zero for any further small decrease in potential;

(f) determining the activation over-potential;

(g) relating said activation over-potential to the concentration of impurities in said sample; and

(h) adjusting the process for the recovery of zinc to obtain optimum recovery of zinc.

4,217,190

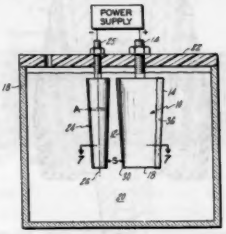
METHOD AND APPARATUS FOR ELECTROCHEMICALLY FINISHING AIRFOIL EDGES

James W. Neal, Willimantic; Joseph F. Loersch, Bolton, and Robert G. Adinolfi, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 20, 1979, Ser. No. 50,388

Int. Cl.[2] C25F *3/14*; B23P *1/04, 1/14, 1/20*

U.S. Cl. 204—129.35 **5 Claims**



1. The method of electrochemically milling the edge of a workpiece wherein different quantities of material must be removed from the workpiece edge at different locations along its length, characterized by providing a shaped electrode having a unit surface area A and spacing distance S between the electrode surface and the workpiece edge, as measured at points along the length of the electrode, wherein both A and S are changed so that the ratio of A/S is changed to lower values at points proximate to locations of the workpiece edge where less unit weight of material is removed.

4,217,191

PROCESS FOR REGENERATING CONTAMINATED ACTIVATED CARBON

Denis Doniat, Paris, France; Jean-Michel Corajoud, Lausanne, Switzerland; Jacques Mosetti, Grand-Lancy-Geneva, Switzerland, and Augusto Porta, Geneva, Switzerland, assignors to Battelle Memorial Institute, Geneva, Switzerland

Continuation of Ser. No. 733,324, Oct. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 679,934, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 405,423, Oct. 11, 1973, abandoned. This application Mar. 1, 1978, Ser. No. 882,083

Claims priority, application Switzerland, Oct. 12, 1972, 14734/72

Int. Cl.[2] C25F *1/00*

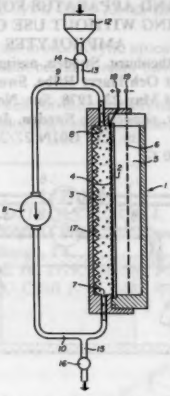
U.S. Cl. 204—130 **2 Claims**

1. An electrochemical regeneration process for eliminating oxidizable adsorbed waste-water pollutants from particulate active carbon contaminated through previous use thereof to purify any industrial or domestic waste-waters, comprising the step of flowing an agitated aqueous slurry of contaminated carbon particles as a slurry electrode through an electrochemical cell so as to repeatedly impinge said particles on a fixed positive collector and to thereby subject the pollutants adsorbed on said particles to oxidation in said cell, wherein said process comprises:

(a) anodically generating atomic oxygen on the positive collector by applying across said cell a voltage sufficient to decompose water by electrolysis in said slurry;

(b) continuously recirculating a slurry of carbon particles contaminated with said adsorbed waste-water pollutants through the electrochemical cell along a closed-loop circuit wherein said contaminated carbon particles in suspension in the slurry leaving said cell are continually recycled directly back to the cell so that said water-pollutants adsorbed thereon are subjected to continually sustained gradual oxidation by means of the atomic oxygen anodically generated by electrolysis while said contaminated carbon particles undergo continually repeated successive passages through the cell due to direct recycling thereof back to said cell;

(c) continuously recirculating said slurry along said closed-loop circuit and recycling said slurry directly back to said cell for a sufficient period of time to allow substantially complete decomposition of said adsorbed waste-water



pollutants due to said continually sustained gradual oxidation thereof by means of said atomic oxygen anodically generated by electrolysis, and to thereby substantially eliminate all of said adsorbed waste-water pollutants by oxidative decomposition during said continually repeated successive passages through said cell.

4,217,192

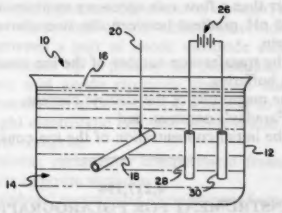
DECONTAMINATION OF METALS USING CHEMICAL ETCHING

Ronald E. Lerch, Kennewick, and Jerry A. Partridge, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 11, 1979, Ser. No. 47,446

Int. Cl.[2] C23G *1/08*; C25C *1/00*

U.S. Cl. 204—149 **10 Claims**



1. A process for reclaiming radiation contaminated equipment by removing radioactive contaminants from metal surfaces of said equipment comprising preparing a solution of nitric acid containing a reduction-oxidation system, wherein said reduction-oxidation system may be reduced and subsequently reoxidized by electrolysis, heating said solution, contacting the metal to be decontaminated with said solution, said contacting effecting a chemical reaction reducing said reduction-oxidation system to the reduced state, disposing a pair of electrodes in said solution, passing an electrical current between said electrodes thereby regenerating the oxidized state and thereby regenerating said solution, said contact of said

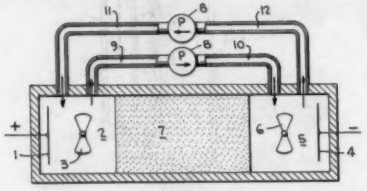
metal with said solution effectively removing said radioactive contaminants from said metal surfaces, and subsequently removing said metal from said solution as an essentially radioactive contaminant-free metal.

4,217,193

METHOD AND APPARATUS FOR ISOELECTRIC FOCUSING WITHOUT USE OF CARRIER AMPHOLYTES

Harry Rilbe, Göthenburg, Sweden, assignor to Ingenjörsfirman Gradient Birgit Och Harry Rilbe, Sweden

Filed May 23, 1978, Ser. No. 908,639
Claims priority, application Sweden, Jun. 2, 1977, 7706359
Int. Cl.[2] G01N *27/28*
U.S. Cl. 204—180 G **16 Claims**



1. A method for the purification of ampholytes through isoelectric focusing, comprising the steps of:

providing an electolytic conductor containing at least one buffering ion constituent;

creating in said electrolytic conductor at least one convection-free zone containing a capillary system;

adding ampholytes to be purified to said convection-free zone;

creating convection zones in said electrolytic conductor on opposite sides of said convection-free zone;

maintaining a convection in each of said convection zones to homogenize the electrolyte in each of said convection zones;

passing direct electric current through the convection-free zone to create in the electrolyte in said convection-free zone a steady pH gradient in the direction of the current; and

creating two equal flows of electrolyte in opposite directions between said two convection zones, the rate of each of said flows of electrolyte being greater than $Ti/2FC$ but no greater than a flow rate necessary to maintain a predetermined pH gradient between the two convection zones, wherein

T is the transference number of the ion constituent without buffering,

i is the magnitude of the electric current,

F is Faraday's constant, and

C is the initial concentration of the ion constituent.

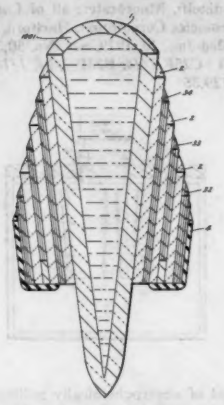
4,217,194

INSTRUMENT FOR POLAROGRAPHIC POTENTIOMETRIC, THERMAL AND LIKE MEASUREMENTS AND A METHOD OF MAKING THE SAME

Dietrich W. Lübbers; Horst Baumgärtl, both of Dortmund, Fed. Rep. of Germany, and Yukio Saito, Tokyo, Japan, assignors to Max-Planck-Gesellschaft zur Förderung der Wissenschaften e.V., Göttingen, Fed. Rep. of Germany

Filed Dec. 1, 1976, Ser. No. 746,328
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1975, 2558947
Int. Cl.[2] C23C *15/00*; G01N *27/36*
U.S. Cl. 204—192 SP **59 Claims**

1. A measuring device for use in biologic systems, including a probe having a body of insulating material and a conductive coat applied on said body to delineate a measuring area thereon, said coat comprising at least one layer of a metal selected from the group consisting of Ta, Pt, Au, Ag, Pd and Al and deposited on said body by a sputtering process per-



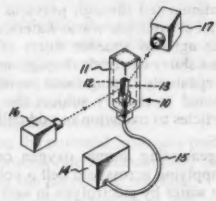
formed in a high frequency field at an output of about 10–40 watts per square centimeter of metal target surface for a period of about 5–10 minutes in an atmosphere having an Ar pressure of about 8×10^{-4} torr.

4,217,195

ELECTROPHORETIC ELECTRODE FOR USE IN LASER DOPPLER SHIFT SPECTROSCOPY, AND METHOD

Egidijus E. Uzgiris, and John A. Bergeron, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 2, 1979, Ser. No. 35,229
Int. Cl.[2] G01N *27/30*
U.S. Cl. 204—195 F **11 Claims**



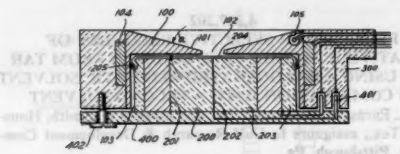
1. In a silver-silver chloride electrode for electrophoretic analysis, the combination of a porous polymer gel coating effective to prevent emission of silver chloride particles into solution during normal use in laser Doppler shift spectroscopy, said organic polymer coating having resistivity less than about 2×10^{-2} ohm centimeter measured in physiological saline solution and being of substantially uniform thickness from 10 to 100 μm.

4,217,196

DISH-ELECTRODE CONCENTRATION METER WITH DETACHABLE TRANSDUCER

Albert Huch, Kugelgasse 1, Marburg D-3550, Fed. Rep. of Germany

Filed May 29, 1979, Ser. No. 43,220
Claims priority, application Fed. Rep. of Germany, May 30, 1978, 2823485
Int. Cl.[2] A61B 5/05; G01N 27/46, 31/14
U.S. Cl. 204—195 B 5 Claims



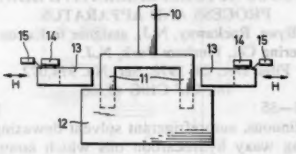
1. An improved dish-electrode concentration transducer unit of the type including a dish-defining structure of thermally conductive material forming a dish into which a quantity of blood on the order of 20–50 microliters is dropped and including a concentration transducer, the improvement comprising a transducer housing of insulating material accommodating the thermally conductive dish-defining structure and forming a transducer compartment in which the transducer is accommodated; means pressing the concentration transducer into thermal engagement with the thermally conductive material of the dish-defining structure; quick-disconnect electrical connectors on the transducer housing for electrically connecting the concentration transducer to a power supply and to an indicator unit and including leads connected to the quick-disconnect electrical connectors and extending away from the transducer housing.

4,217,197

APPARATUS FOR REMOVING ANODE RESIDUE FROM ANODES OF ELECTROLYTIC MELT BATHS

Klaus Harder, Lünen, and Martin Schwert, Werne, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lünen, Fed. Rep. of Germany

Filed Jul. 18, 1979, Ser. No. 58,344
Int. Cl.[2] B01K 3/00; C25C 3/00, 3/06
U.S. Cl. 204—243 R 7 Claims



1. In apparatus for removing anode residue from anodes of electrolytic melt baths and comprising at least one stripper member which is movable in relation to a portion of an anode to strip and effect removal of the anode residue thereon; the improvement comprising a sensor carried by the stripper member for sensing the presence or absence of the anode portion, thereby to signify damage thereto.

4,217,198

COATED PERFLUOROSULFONIC ACID RESIN MEMBRANES AND A METHOD FOR THEIR PREPARATION

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 23, 1979, Ser. No. 23,065
Int. Cl.[2] C25C 7/04; C25B 13/08; B05D 1/02
U.S. Cl. 204—252 10 Claims

1. A membrane for use in electrolytic processes comprised of a film of a perfluorosulfonic acid resin having a fluoroalkyl resin coating.

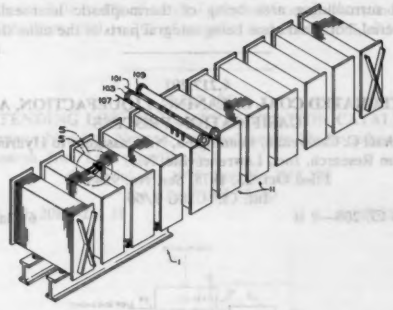
10. An electrolytic cell for the electrolysis of aqueous solutions of alkali metal chlorides employing the coated membrane of claims 1, 3, or 6.

4,217,199

ELECTROLYTIC CELL

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 10, 1979, Ser. No. 56,152
Int. Cl.[2] C25B 1/16, 1/26, 9/02
U.S. Cl. 204—256 30 Claims



1. An electrolytic cell comprising a plurality of hollow anode electrode elements electrically in parallel with each other, and a plurality of hollow cathode electrode elements electrically in parallel with each other; each of said anode electrode elements interposed between a pair of cathode electrode elements and separated therefrom by a planar, ion permeable, separator sheet; each of said cathode electrode elements interposed between a pair of anode electrode elements and separated therefrom by a planar, ion permeable, separator sheet; wherein said anode electrode elements and cathode electrode elements are in compression whereby to provide an electrolyte tight electrolytic cell, and wherein said individual electrode units comprise:

(a) a peripheral, rectangular compartment frame open on two major opposite surfaces;

(b) said peripheral rectangular compartment frame comprising a pair of vertical "U" shaped channel frames, and a pair of horizontal "U" shaped channel frames; one of said vertical "U" shaped channel frames, and both of said horizontal "U" shaped channel frames being concave with respect to the interior of the anode unit; and the other of said "U" shaped vertical channel frames being convex with respect to the interior of the anode units;

(c) plate means within said concave vertical "U" shaped channel frame whereby to form an internal downcomer;

(d) bus bar means extending outwardly from said convex vertical channel frame;

(e) a planar metal electrode on each of said open major surfaces; and

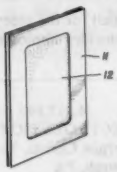
(f) electrolyte feed means, gas recovery means, and liquid recovery means passing through said compartment frame.

4,217,200

MEMBRANES

Ora Kedem; Abraham Kedem, both of Rehovot; Menashe Lev, Ramt-Gan; Gerald B. Tanny, Rehovot, and Rami Messalem, Beer Sheva, all of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Aug. 9, 1978, Ser. No. 932,406
Claims priority, application Israel, Aug. 16, 1977, 52757
Int. Cl.[2] B01D *13/02*
U.S. Cl. 204—301 **15 Claims**



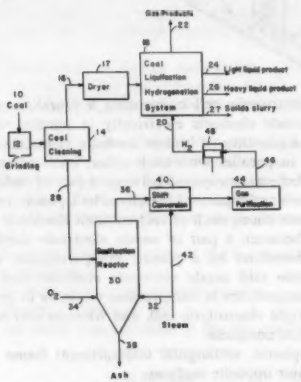
1. A membrane unit for use in electrodialysis comprising a sheet having an area constituting an active ion exchange membrane and a region surrounding said active membrane area, said surrounding area being of thermoplastic heat-sealable material, both said areas being integral parts of the same sheet.

4,217,201

INTEGRATED COAL CLEANING, LIQUEFACTION, AND GASIFICATION PROCESS

Michael C. Chervenak, Pennington, N.J., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Oct. 23, 1978, Ser. No. 954,015
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 R **6 Claims**



1. A coal hydrogenation process for producing hydrocarbon gas and liquid product streams, comprising the steps of:

(a) grinding the coal to smaller than about 20 mesh;

(b) cleaning the particulate coal so as to form an ash-reduced portion and an ash-enriched portion;

(c) feeding the ash-reduced coal portion to a liquefaction-hydrogenation reaction zone with hydrogen to produce hydrocarbon gas, a liquid product stream, and a heavy liquid residue slurry stream containing unreacted coal and ash;

(d) gasifying the ash-enriched coal portion in a gasification zone to produce a synthesis gas containing principally H_2 and CO;

(e) withdrawing ash from the coal gasification zone;

(f) shift converting the synthesis gas with steam to produce an enriched hydrogen gas stream;

(g) removing CO_2 and H_2S impurities from the enriched hydrogen stream and purifying same to form a high purity hydrogen stream;

(h) passing the high purity hydrogen gas to the hydrogenation reaction zone to provide the high purity make-up hydrogen needed at (c); and

(i) withdrawing hydrocarbon gas and liquid products from the hydrogenation reaction zone.

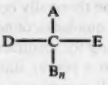
4,217,202

PROCESS FOR SELECTIVE RECOVERY OF RELATIVELY METALS-FREE BITUMEN FROM TAR SAND USING A HALOGENATED ALIPHATIC SOLVENT IN COMBINATION WITH A SECOND SOLVENT

John A. Paraskos, Pittsburgh, Pa., and Edward W. Smith, Houston, Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 844,430, Oct. 21, 1977, abandoned. This application Nov. 8, 1978, Ser. No. 958,673
Int. Cl.[2] C10G *1/00*
U.S. Cl. 208—11 LE **31 Claims**

1. A process for extracting substantially metal-free bitumen from tar sand composed of individual grains of sand surrounded by a thin film of water and further encased by an outer layer of bitumen which comprises contacting said tar sand with a two-solvent system comprising a first halogenated aliphatic solvent of the formula:



wherein n is an integer of from about 1 to about 20, preferably from about 1 to about 10; and wherein A, B, D and E are either alike or different members selected from the group consisting of hydrogen, chlorine, bromine or fluorine and mixtures thereof, with the provision that at least one of said A, B, D or E is chlorine, bromine or fluorine; in combination with a second solvent comprising an oxygenated compound; agitating said tar sand with said solvent system at ambient temperatures and under atmospheric pressure, sufficient to substantially dissolve said bitumen in said solvent system but without rupturing said film of water, thereby forming two phases, one consisting essentially of said solvents with said bitumen dissolved therein and the other composed of said individual grains of sand carrying solely said film of water, separating said phases from each other and then separating said solvents from said bitumen.

4,217,203

CONTINUOUS AUTOREFRIGERATIVE DEWAXING PROCESS AND APPARATUS

Douglas G. Ryan, Rockaway, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 28, 1978, Ser. No. 974,072
Int. Cl.[2] C10G *43/08*
U.S. Cl. 208—35 **14 Claims**

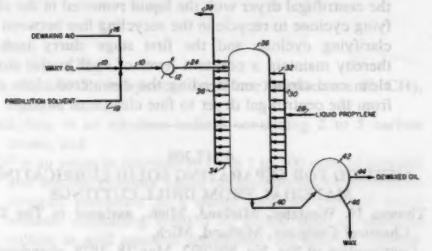
1. A continuous, autorefrigerant solvent dewaxing process for dewaxing waxy hydrocarbon oils which comprises the steps of:

(a) prediluting the waxy oil with a non-autorefrigerant dewaxing solvent to form a mixture of waxy oil and solvent;

(b) passing said mixture from step (a), at a temperature above its cloud point, into the top of a continuous, autorefrigerative chilling zone which comprises a vertical, elongated, multi-staged tower operating at a constant pressure wherein each stage contains a liquid spaced and a vapor space above the liquid space, each of said vapor spaces

also containing means for removal of autorefrigerant vapor therefrom;

(c) cooling said mixture as it passes down from stage to stage in said chilling zone to precipitate wax from said oil thereby forming a slurry comprising solid particles of wax and a dewaxed oil/solvent solution and further chilling the so-formed slurry by contacting same, in said chilling zone, with a liquid autorefrigerant which in introduced under flow rate control conditions into a plurality of the stages in said zone and allowed to evaporate therein so as to achieve an average cooling rate of the slurry in said



zone ranging from between about 0.1° to 20° F. per minute with an average temperature drop across each stage into which said liquid autorefrigerant is introduced and evaporated ranging from between about 2° to 20° F. and wherein the evaporated autorefrigerant is removed from each of said stages into which said liquid autorefrigerant was injected in a manner such that the autorefrigerant vapor formed in any given stage does not pass through all of the stages in the tower above said stage; and

(d) separating the wax from the slurry to obtain wax and a dewaxed oil solution.

4,217,204

PROCESS FOR CRACKING HYDROCARBONS UTILIZING A MIST OF MOLTEN SALT IN THE REACTION ZONE

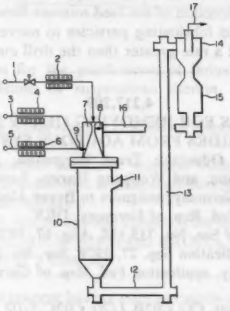
Atsushi Sakai, Otake; Fumiaki Yamaguchi; Tetsu Kawazoe, both of Iwakuni; Hayato Yonemori, Koganei, and Yoshio Machida, Iwakuni, all of Japan, assignors to Mitsui Engineering and Shipbuilding Co., Ltd. and Mitsui Petrochemical Industries Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 974,048, Dec. 28, 1978, abandoned, which is a continuation of Ser. No. 824,171, Aug. 12, 1977, abandoned. This application Feb. 7, 1979, Ser. No. 10,131

Claims priority, application Japan, Feb. 13, 1978, 53-14127

Int. Cl.[2] C10G *9/34*

U.S. Cl. 208—125 **7 Claims**



1. A process which comprises cracking hydrocarbons in a cracking reaction zone in the presence of a mist of molten salt containing salt particles with an average particle size up to 300 microns, said salts being selected from the group consisting of basic compounds of alkali metals, alkaline earth metals and mixtures thereof, the weight ratio of molten salt to hydrocarbon being from 0.01:1 to 10:1, introducing the resulting cracked gas containing mist of molten salt into a means for quenching at a temperature not lower than the melting point of the molten salt, and separating the cracked gas and the molten salt from each other.

4,217,205

CATALYSTS FOR HYDROCARBON CONVERSION

Christian Marcilly, Houilles; Jean-Francois Le Page, Rueil Malmaison; Germain Martino, Poissy, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des Products pour Catalyse, Rueil-Malmaison, France

Filed Aug. 25, 1978, Ser. No. 936,966

Claims priority, application France, Aug. 26, 1977, 77 26278

Int. Cl.[2] C10G *35/08*

U.S. Cl. 208—139 **21 Claims**

1. In a process for reforming a hydrocarbon feed in the presence of a catalyst, the improvement which comprises using as said catalyst a catalyst containing an alumina carrier and, by weight with respect to the alumina carrier, from 0.005 to 1% of platinum, 0.01 to 4% of a metal selected from gallium, indium and thallium, 0.01 to 2% of tungsten and 0.1 to 10% of halogen.

4,217,206

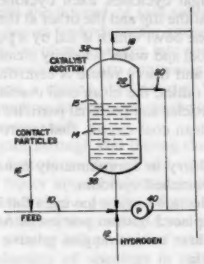
EXTENDING LIFE OF DEMETALLIZATION CATALYST

Govanon Nongbri, Newton, Pa., assignor to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Jul. 20, 1977, Ser. No. 817,275

Int. Cl.[2] C10G *25/00*

U.S. Cl. 208—251 H **10 Claims**



1. A process for the catalytic demetallization of Venezuelan crude oil feedstocks containing organometallic impurities comprising Vanadium and nickel, in a reaction zone wherein demetallization catalyst, hydrogen and crude oil feedstock are brought into intimate contact under operating conditions of temperature, between 700° and 850° F., pressure between, 56 and 245 atmospheres, (800 to 3500 psig) and liquid space velocities between 0.2 to 1.5 $V_f/hr/V_r$ comprising the steps of:

(a) initially feeding the feedstock to the reaction zone containing a fresh initial charge of the demetallization catalyst, under operating conditions of temperature, pressure and space velocity selected within said ranges, such that the initial level of Vanadium removal does not exceed 75 wt. percent;

(b) maintaining said operating conditions for a period sufficiently long, such that the level of Vanadium removal decreases by about 10% of the initial level;

(c) adjusting said operating conditions to achieve a desired level of metals removal, said level being less than 75 wt. percent;

(d) removing a demetallized stream from the reaction zone.

4,217,207

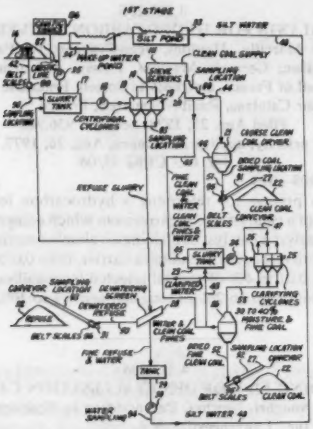
CONTINUOUS METHOD OF CLEANING A SLURRY OF CRUSHED RAW COAL

Delbert I. Liller, Rte. 4, Box 64, Deer Park, Md. 21550

Continuation of Ser. No. 860,330, Dec. 14, 1977. This application Dec. 26, 1978, Ser. No. 973,408

Int. Cl.[2] B03B *7/00*

U.S. Cl. 209—13 **1 Claim**



1. In a continuous coal washing method in a plant comprising a first stage slurry tank for mixing raw crushed coal and water, a pump feeding slurry through an inlet, a plurality of bunched centrifugal cyclones, each cyclone having a bowl, two outlets, one at the top and the other at the bottom, and one inlet to the cyclone bowl which is fed by a pump with a slurry of crushed raw coal and water whereby clean coal is separated at the top outlet and heavy refuse is centrifugally withdrawn from the bottom outlet, the clean coal consisting of a mixture of coarse coal particles and fine coal particles in water circulating in a closed clean coal circuit, that improvement comprising:

pumping the slurry in approximately equal proportions to each of the bunched cyclones;

installing a deflection surface having a flat body portion and inwardly displaced bottom portion into the inlet of each cyclone at three critical angles relative to the inlet and cyclone bowl:

(1) a center angle made by the inwardly displaced bottom of the surface relative to the inlet cross section center line being between 116° and 148°,

(2) the deflection angle made by the said flat body portion relative to the non-tangential wall of the inlet being between 8° and 12°, and

(3) the included angle between the radius of the cyclone bowl and the said flat body portion being between 120° and 170° to thereby separate clean coal at the outlet at the top and refuse at the outlet at the bottom of the cyclone;

first feeding the coal output in the clean coal circuit to a dewatering screen to reduce the water content for subsequent drying of the mixture and collecting of a fine coal slurry below said screen;

feeding the dewatered mixture of clean coal from the top of said screen to a first centrifugal dryer to provide clean coal of reduced water content and removing a second fine clean coal slurry from said centrifugal dryer;

mixing the fine coal slurry removed from below said screen and the fine coal slurry removed from said dryer for subsequent recovery of clean coal therefrom in a clarifying portion of the closed clean coal circuit, said clarifying portion comprising a slurry tank for mixing the two slurries, a pump, a clarifying cyclone, a centrifugal dryer fitted with a basket screen, and recycling lines between the clarifying cyclone and the first stage slurry tank;

passing the mixture of fine coal slurry through said clarifying cyclone of said closed clean coal circuit;

feeding the dewatered fine coal from the clarifying cyclone into a centrifugal dryer fitted with a basket screen to further reduce the water content; and

mixing the slurry of fine coal passing through the screen of the centrifugal dryer with the liquid removed in the clarifying cyclone to recycle in the recycling line between the clarifying cyclone and the first stage slurry tank to thereby maintain a constant level of coal in the closed clean coal circuit and sending the dewatered clean coal from the centrifugal dryer to fine clean coal storage.

4,217,208

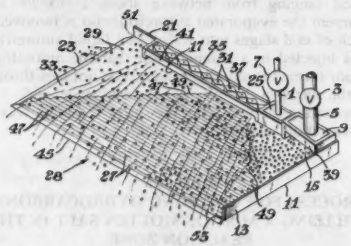
METHOD FOR SEPARATING SOLID LUBRICATING MATERIAL FROM DRILL CUTTINGS

Thomas H. Wentzler, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 906,892, May 18, 1978, abandoned. This application Jun. 25, 1979, Ser. No. 51,918

Int. Cl.[2] B03B *5/04*

U.S. Cl. 209—18 **8 Claims**



1. A method for separating solid lubricating particles from a mixture of solid lubricating particles and drill cuttings, wherein the lubricating particles have a specific gravity less than the specific gravity of the drill cuttings comprising the steps of:

(1) depositing a feed mixture containing the solid lubricating particles and drill cuttings on a reciprocating deck which operates in a manner such that the feed mixture flows in one direction across the deck; and

(2) passing a wash stream of a drilling mud across the feed mixture in a second direction approximately perpendicular to the direction of the feed mixture flow thereby causing the solid lubricating particles to move in the second direction at a rate greater than the drill cuttings.

4,217,209

PROCESS FOR REMOVING HEAVY METAL SULPHIDES FROM AQUEOUS SYSTEMS

Guido Steffan, Odenthal; Ernst Borgmann, Alsdorf; Peter Büchel, Cologne, and Wolfgang Harms, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany, DEX

Continuation of Ser. No. 715,115, Aug. 17, 1976, abandoned. This application Sep. 27, 1978, Ser. No. 946,341

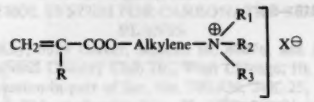
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2536969

Int. Cl.[2] C02B *1/20;* **C02C** *5/02*

U.S. Cl. 210—53 **8 Claims**

1. A process for substantially removing HgS from hot and strongly acid dyestuff or dyestuffs precursor waste effluents

consisting essentially of sequentially adding firstly an anionic polymer comprising an acrylic acid/acrylamide or methacrylic acid/acrylamide copolymer and secondly a cationic polymer comprising a homopolymer or copolymer of a compound of the formula



in which

R is H or CH_3;

R_1, R_2 and R_3 independently of one another are H, CH_3, C_2H_5 or C_3H_7;

Alkylene is an alkylene radical containing 2 to 5 carbon atoms; and

$X^{\ominus}$ is an anion in amounts of from 1 to 100 ppm of cationic and anionic polymer based on the amount of effluent or dyestuff precursor to a dilute aqueous dyestuff waste effluent containing from 5 to 10,000 ppm of mercury sulfide in acid aqueous suspension, the ratio of cationic polymer to anionic polymer ranging from 5:1 to 1:5 by weight, said effluent having a pH of less than 2 and a temperature of from 60° C. to about 120° C., to agglomerate the mercury sulfide into stable, coarse flocs, and then removing said flocs from the effluent by filtration.

4,217,210

PROCESS AND MEANS FOR BREAKING EMULSIONS

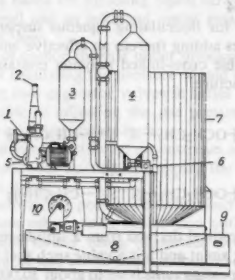
Johann Heidenreich, Bondy, France, assignor to Societe Anonyme dite: Technime S.A., Buchelay, France

Filed Jul. 21, 1978, Ser. No. 927,128

Claims priority, application France, Jul. 21, 1977, 77 22426

Int. Cl.[2] B01D *15/00*; C02B *1/20*

U.S. Cl. 210—28 **8 Claims**



1. A process for the purification of industrial sewage by breaking emulsions or suspensions therein, comprising the steps of:

(a) forming a liquid reagent in aqueous dispersion or solution form and comprising

(1) an adsorbent substance selected from the group consisting of bentonite, argillaceous earths, alkaline earths and their mixtures,

(2) at least one compound chosen from the group consisting of Al, $AlCl_3$, Al_2O_3 and $Al(OH)_3$,

(3) an acid or a base, and

(4) water,

said liquid reagent having micro-crystals of the said aluminum derivatives associated with the active sites of said adsorbent substance; and

(b) stirring the said emulsion or suspension to be treated with said liquid reagent.

4,217,211

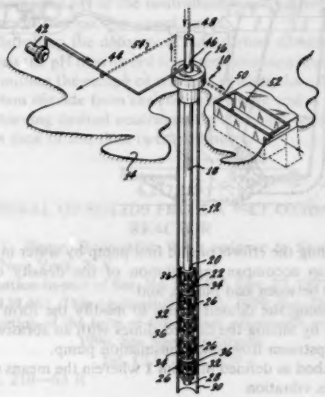
PRESSURIZED TREATMENT OF SEWAGE

Theodore H. Crane, Fountain Valley, Calif., assignor to Bio-Mass Fuel Conversion Associates, Inc., Yuba City, Calif.

Filed Jul. 9, 1979, Ser. No. 55,549

Int. Cl.[2] C02C *1/06*

U.S. Cl. 210—7 **9 Claims**



6. In a process for aerobic treatment of sewage by passing a liquor of raw sewage, an oxygen containing gas and a microorganism seed suspension in a liquid carrier into an elongated subterranean shaft by descending said liquor into the lower extremity of said subterranean shaft and allowing said liquor to ascend to the surface of said subterranean shaft, the improvement which comprises:

passing said liquor in a descending direction through an input shaft into the interior of said subterranean shaft to subject said liquor to hydrostatic pressure to effect increased solubility of said oxygen into said liquor;

passing said pressurized oxygen containing liquor from said input shaft into a mixing shaft located below said input shaft and extending downwardly to the bottom reaches of said subterranean shaft;

moving said liquor through said mixing shaft to deposit said liquor at the bottom reaches of said subterranean shaft;

ascending said liquor up said subterranean shaft;

continuously entraining a portion of said ascending liquor back into said liquor descending down through said mixing shaft by passing said portion of said ascending liquor through a plurality of openings in said mixing shaft in causing said entrained portions to be mixed within said descending liquor within said mixing shaft.

4,217,212

METHOD OF PUMPING AND PROCESSING PHOSPHATE SLIME FOR LAND RECLAMATION

Troy M. Deal, P.O. Box 3348, Orlando, Fla. 32802

Filed Jun. 19, 1978, Ser. No. 916,584

Int. Cl.[3] C02F *1/34*

U.S. Cl. 210—19 **4 Claims**

1. A method of reclaiming land and reducing the environmental impact of mining phosphate rock which involves the pumping of semi-liquid phosphate slimes from settling ponds while simultaneously modifying the form of the slimes to facilitate dewatering comprising the following steps:

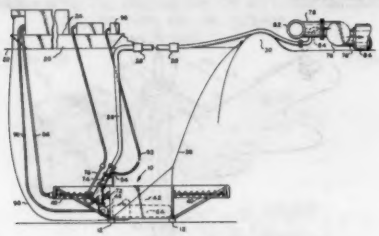
(a) moving the slimes toward the inlet of a pump by mechanical means, the inlet communicating with a pressure chamber,

(b) pressurizing the chamber by the movement of said slimes from the pond into said chamber,

(c) controlling the rate of slimes movement by said means

into said chamber by means responsive to the pressure in said chamber,

(d) exerting a positive pumping force on said slimes by said pump to move said slimes from said chamber through said inlet toward a transmission pump and associated pipe structure,



(e) boosting the efforts of said first pump by water injection with an accompanying dilution of the density of said slimes between said pumps, and

(f) scrubbing the diluted slimes to modify the form of the slimes by mixing the diluted slimes with an abrasive mixture upstream from said transmission pump.

2. A method as defined in claim 1 wherein the means of step (a) involves vibration.

4,217,213

DEVICE FOR THE SEPARATION OF MINUTE MAGNETIZABLE PARTICLES, METHOD AND APPARATUS

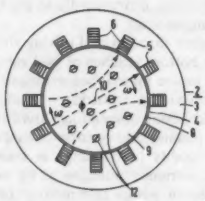
Karl Schüster, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,534

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738649; Sep. 26, 1977, 2743213

Int. Cl.[2] B01D *35/06*

U.S. Cl. 210—42 S **22 Claims**



1. A device for the agglomeration of minute magnetizable particles down to particle sizes below 1 μm from a gaseous or liquid medium which includes a working volume permeated by a magnetic field, into which the medium is introduced in combination with a filtering system for the separation of said particles from said medium, comprising

(a) a tubular member of non-magnetic material adapted to have said medium thereto;

(b) means surrounding a first portion of said member on its outside surface for generating a rotating field which is oriented at least approximately radially relative to the axis of the cylinder and which rotates around said axis, said first portion defining the working volume of said device said field causing an agglomeration of said minute particles to form larger structures; and

(c) a filter system disposed in said tubular member downstream of the working volume for separating said larger structures from said medium.

4,217,214

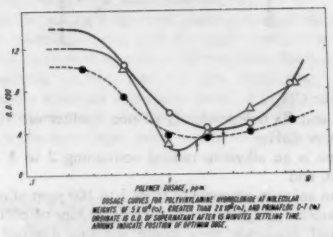
HIGH MOLECULAR WEIGHT POLYVINYLAMINE HYDROCHLORIDE AS FLOCCULANT

Paul L. Dubin, Menlo Park, Calif., assignor to Dynapol, Palo Alto, Calif.

Filed Oct. 10, 1978, Ser. No. 949,932

Int. Cl.[2] B01D *21/01;* **C02B** *1/20*

U.S. Cl. 210—52 **6 Claims**



DOSAGE CURVES FOR POLYVINYLAMINE HYDROCHLORIDE AT MOLECULAR WEIGHTS OF 3.5 10^5 (○), GREATER THAN 25 10^5 (△), AND PRIMAFLOC C-7 (▽) INDICATE O.D. OF SUPERNATANT AFTER 15 MINUTES SETTLING TIME. ARROWS INDICATE POSITION OF OPTIMUM DOSE.

1. In a method for treating suspensions of particulate solids in water to reduce the amount of solids contained therein, the improvement comprising admixing a sufficient amount of polyvinylamine hydrochloride of molecular weight at greater than 3×10^5 with the suspension to serve as a flocculating agent for the solids, and thereafter separating the flocculated particulate solids from said water.

4,217,215

PROCESS FOR FLOCCULATION USING CROSSLINKED POLYSULFONIUM COMPOUNDS

Hans P. Panzer, Stamford; Anthony T. Coscia, Norwalk, and Albert G. Robustelli, Darien, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 19, 1979, Ser. No. 4,641

Int. Cl.[2] B01D *21/01;* **C02B** *1/20*

U.S. Cl. 210—54 **5 Claims**

1. A process for flocculating aqueous suspension of solids which comprises adding thereto an effective amount of a cationic water-soluble cross-linked polymer containing repeating units of the structure:

$$+OCH_2CH_2-X^-S^+-CH_2CH_2+_n$$
$$\quad\quad\quad

phosphonic acid or a derivative thereof selected from the group consisting of hexamethylenediamine tetra(methylene phosphonic acid) and the dimer of hexamethylenediamine tetra(methylene phosphonic acid).

4,217,217

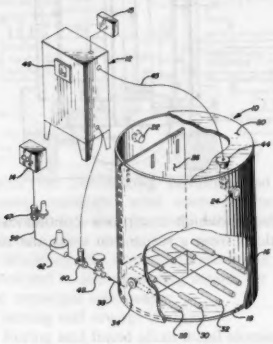
PH CONTROL SYSTEM FOR CARBONATED BEVERAGE PLANTS

David S. Kay, 5029 Culver, Skokie, Ill. 60076, and James F. Kahle, 4N665 Country Club Dr., West Chicago, Ill. 60185

Continuation-in-part of Ser. No. 700,020, Jun. 25, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,666

Int. Cl.[2] C02D *1/04;* B01F *3/04*

U.S. Cl. 210—59 **6 Claims**



1. A system for treating alkaline waste waters discharged from a carbonated beverage plant under atmospheric pressure so as to control the pH thereof; said system comprising:

(a) a reaction vessel for receiving alkaline waste water and into which carbon dioxide may be introduced, said vessel including a baffle for directing liquid flow to the bottom of said vessel and an inlet and outlet means to permit a continuous flow;

(b) a source of carbon dioxide under pressure;

(c) means for regulating the pressure of said carbon dioxide comprising two regulator valves in series plus a throttle valve capable of adjusting the gas pressure to less than about 6 pounds per square inch;

(d) a solenoid valve positioned downstream of the two pressure regulators for starting or stopping the flow of carbon dioxide on signal;

(e) diffuser tube means positioned within said reaction vessel at a position substantially below said outlet means, said diffuser tube means being connected with the carbon dioxide source and serving to distribute the finely divided gas throughout the water to be treated;

(f) means for connecting the source to the regulator valves, the regulator valves to the throttle valve, the throttle valve to the solenoid valve, the solenoid valve to the diffuser tube means; and

(g) sensing means associated with said reaction vessel for sensing the pH of water in said vessel, said sensing means being upstream from the outlet and being further associated with said solenoid valve so as to deliver carbon dioxide into the diffuser tube means in the event that the pH exceeds a predetermined level.

6. A method for neutralizing alkaline waste waters from a carbonated beverage plant, said method comprising the steps of:

(a) receiving the waste water into a reaction vessel having substantially straight side surfaces and operating at atmospheric pressure, said reaction vessel including an inlet and an outlet;

(b) delivering carbon dioxide into the inlet of said reaction vessel through diffuser tube means having pore openings of less than or equal to 240 microns, and at a pressure no greater than six pounds per square inch more than that of the waste water head pressure;

(c) forcing the waste water down behind a baffle plate so that it passes into a reaction zone in said reaction vessel within twelve inches of the level at which carbon dioxide is introduced;

(d) sensing the pH of the neutralized waste water at a point adjacent the reaction vessel outlet;

(e) controlling the delivery of said carbon dioxide so as to adjust the pH downward to a predetermined level without permitting the escape or wastage of more than 30% of the carbon dioxide from the reaction vessel; and

(f) achieving desired neutralization efficiency with a detention time of less than twenty minutes.

4,217,218

REMOVAL OF SOLIDS FROM A WET OXIDATION REACTOR

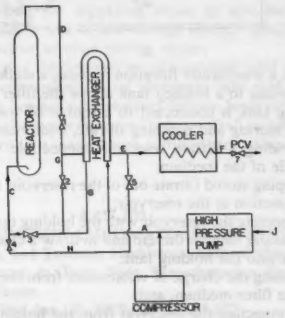
Gerald L. Bauer, Rothschild, Wis., assignor to Sterling Durg Inc., New York, N.Y.

Continuation-in-part of Ser. No. 864,497, Dec. 27, 1977, Pat. No. 4,139,461. This application Jan. 2, 1979, Ser. No. 78

The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.

Int. Cl.[2] C02B *1/34*

U.S. Cl. 210—63 R **4 Claims**



1. A process for discharging unwanted slurried solids accumulation from a wet air oxidation system for conditioning or oxidizing sludge, which system includes a pressurized sludge flow through the cold side of a heat exchanger to the inlet of a reactor; the reactor effluent passing from the outlet of the reactor through the hot side of the heat exchanger to an adjustable pressure control valve; a normally open valved line between the outlet of the cold heat exchanger side and the reactor inlet; a normally opened valved line between the inlet of the hot heat exchanger side and the reactor outlet, and a normally closed, valved line connecting the outlet of the cold heat exchanger side with the inlet of the hot heat exchanger side, wherein said process comprises changing the sludge flow to an alternate clear flushing water source while isolating the reactor from the heat exchanger by closing at least the valve in the line between the reactor outlet and the hot heat exchanger side inlet and opening the valve in the line between the cold heat exchanger side outlet and the hot heat exchanger side inlet, characterized by the fact that the system includes a normally closed valved line communicating the bottom portion of the reactor to a point upstream from the pressure control valve, but downstream from the heat exchanger, and after water has flowed between the heat exchanger and the pressure control valve, opening the valve between the cold heat exchanger side outlet and the reactor inlet, closing the valve between the cold heat exchanger side outlet and the hot heat exchanger side inlet, opening the valve in the line communicating the bottom

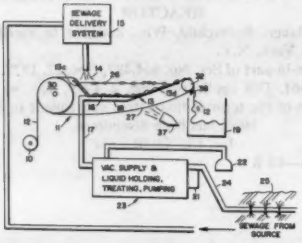
portion of the reactor with the point between the heat exchanger and the pressure control valve and reducing the setting on the pressure control valve to below the pressure in the reactor, thereby allowing unwanted slurried solids to flow from the reactor and be mixed with, diluted by and cooled by the flush water stream prior to flushing from the system through the pressure control valve.

4,217,219

SEWAGE DELIVERY AND FILTRATION SYSTEM

Steven B. Mullerheim, Kensington, and Fred G. Williams, Jr., San Anselmo, both of Calif., assignors to Great Circle Associates, Walnut Creek, Calif.

Division of Ser. No. 752,201, Dec. 20, 1976, Pat. No. 4,137,062.
This application Jan. 29, 1979, Ser. No. 7,214
Int. Cl.[2] B01D *37/00, 35/00*
U.S. Cl. 210—65 **7 Claims**



1. In a wastewater filtration process, a method of delivering wastewater to a holding tank above the filter medium, which holding tank is connected to a source of wastewater below, and of storing and pumping filtrate, comprising:

providing a filtrate reservoir connectible with the filtrate side of the medium;

pumping stored filtrate out of the reservoir, thereby creating a suction in the reservoir;

connecting the reservoir with the holding tank near its top to transfer suction thereto and to draw a charge of wastewater into the holding tank;

releasing the charge of wastewater from the holding tank to the filter medium, and;

disconnecting the reservoir from the holding tank and connecting it to an enclosure at the filtrate side of the filter medium, thereby to refill the reservoir with filtrate.

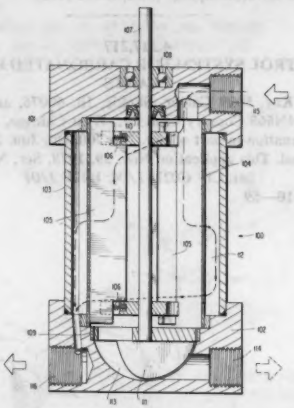
4,217,220

ROTARY FILTER

Rene Egli, Sins; Hans-Rudolf Staub, Eggenwil, and Kurt Feneberger, Sins, all of Switzerland, assignors to Lonza Ltd., Valais, Switzerland

Filed Jun. 9, 1978, Ser. No. 914,137
Claims priority, application Switzerland, Jun. 9, 1977, 7113/77
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—79 **20 Claims**

1. A perpendicular-standing rotary filter for the continuous separation of coarse particles from a suspension which comprises an upper part which consists of (i) a cylindrical filter basket having a filter jacket, (ii) a cylindrical jacket, the filter basket being centrally disposed in the cylindrical jacket, the suspension being fed into the cylindrical filter basket, (iii) a chamber for the filtered material formed by the space between the inner surface of the cylindrical jacket and the outer surface of the filter jacket of the filter basket, and (iv) at least one centrally-located rotable scraper, which is continuously forced by means of a compression spring against the inner surface of the filter jacket, and a lower part which consists of (a) a sump chamber in which at least one rotable stirring sheet is centrally disposed, (b) one outlet for the filtered material and (c) one outlet for the separated material, the sump chamber being continuously in communication with the outlet for the separated material.



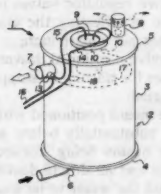
7. A process which comprises continuously separating coarse particles from a suspension using the rotary filter of claim 1.

4,217,221

OIL REFINING APPARATUS

Joseph I. Masso, 8761 Blue Lake Dr., San Diego, Calif. 92119

Filed May 7, 1979, Ser. No. 36,744
Int. Cl.[2] B01D *35/18*
U.S. Cl. 210—168 **5 Claims**



1. In combination with an internal combustion engine, an apparatus for refining motor oil which comprises:

a closed chamber having an oil inlet in the base section;

a vapor outlet in the upper section;

an oil outlet at an intermediate level between the oil inlet and the vapor outlet;

means for heating the interior of said chamber having:

a vertical tubular column in the center of the chamber;

a plurality of vanes extending radially from said column across said chamber;

a heating resistor within the column; and

means for connecting the resistor to a source of electrical current;

means for connecting the inlet to a source of pressurized oil in the engine; and

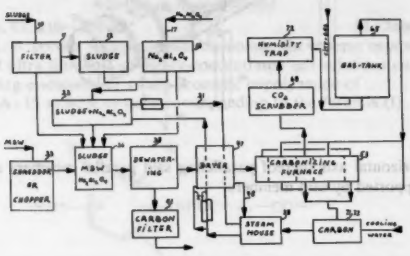
means for connecting the oil outlet to the engine crankcase.

4,217,222

APPARATUS FOR PROCESSING MUNICIPAL SOLID WASTE AND SEWAGE SLUDGE

Alfred J. Harendza-Harinxma, 50 Merion Pl., Lawrenceville, N.J. 08648

Filed Mar. 21, 1977, Ser. No. 779,689
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—177 1 Claim



1. Apparatus for carbonizing cellulose and other organic—containing municipal solid waste products with an alkali metal aluminate which has been dissolved in sewage sludge, which comprises:

means for shredding said municipal solid waste;

means, connected to said shredding means, for storing said shredded municipal solid waste;

means for storing said sewage sludge;

means for storing said liquid alkali metal aluminate;

means for mixing said sewage sludge with a water solution of an alkali metal aluminate;

means for connecting said sewage sludge storing means said liquid alkali metal aluminate storing means to said sewage sludge solution and alkali metal aluminate mixing means;

means for mixing said sewage sludge—alkali metal aluminate and said shredded municipal solid waste;

means for conducting the sewage sludge—alkali metal aluminate solution means to said mixing means for mixing said sewage sludge—alkali metal aluminate solution with shredded municipal solid waste;

means for removing the moisture from said municipal solid waste/sewage sludge—alkali metal aluminate mixture;

means for conducting the mixture of said sewage sludge—alkali metal aluminate—municipal solid waste to said means for removing the moisture from said municipal solid waste/sewage sludge—alkali metal aluminate mixture;

means for drying the dewatered municipal solid waste/sewage sludge—alkali metal aluminate mixture;

means for transporting the dewatered municipal solid waste/sewage sludge—alkali metal aluminate through said means for drying;

a carbonizing furance, said furnace being tilted at an angle of from 5° to 25° with the mixture to be carbonized entering at the upper end and flowing under the combination of gravitational and rotational forces towards the lower end, said furnace comprising:

a sealed cylindrical member;

a rotatable, cylindrical member concentrically and coaxially mounted within said sealed cylindrical stationary member;

means for rotating said rotatable member;

means for sealing the gap between the outer wall of said sealed cylindrical rotatable member and the inner wall of said stationary member, said sealing means dividing said furnace into first, second, third, fourth and fifth sub-chambers, the walls of said rotatable member being perforated in said first, third and fifth sub-chambers;

means for supplying a combustible gas to said second and fourth sub-chambers;

means for collecting pyrolysis gases from said first, third and fifth sub-chambers;

means, associated with said third and fifth sub-chambers, for collecting and cooling the carbonized material passing through the perforations in said rotatable chamber, said apparatus further comprising:

means, associated with said carbonizing furnace for collecting any pyrolysis gases given off by said mixture as it is carbonized;

means, connected to said collecting means, for scrubbing any CO_2 gas present in said pyrolysis gases;

means for connecting the pyrolysis gases collected by said collecting means to said CO_2 scrubbing means;

means, connected to said scrubbing means, for removing any excess moisture in said scrubbed pyrolysis gases;

means for connecting the scrubbed CO_2 gas to said moisture removing means;

means for adding said dried pyrolysis gases to the combustible gases in said gas supplying means to augment the heating of said heating means;

means for supplying a flow of cooling water;

means for discharging the carbonized material from the carbonizing furnace;

means for collecting and cooling the carbonized material discharged from said carbonizing furnace;

means for connecting said collecting and cooling means to said water supplying means;

means for generating steam, said generating means receiving the pre-heated output water flow from said collecting and cooling means, for supplying steam to said moisture-removing means and to said sewage sludge—alkali metal aluminate water solution mixing means;

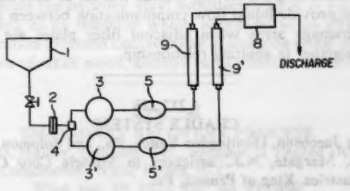
means for feeding the dry mixture of municipal solid waste/-sewage sludge—alkali metal aluminate into said rotary carbonizing furnace whereby said furnace heats said dried municipal solid waste/sewage sludge—alkali metal aluminate mixture to a temperature sufficient to carbonize the same.

4,217,223

GEL PERMEATION CHROMATOGRAPH SYSTEM

Nobuyuki Baba, and Tsutomu Hashimoto, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jan. 30, 1979, Ser. No. 7,677
Claims priority, application Japan, Feb. 1, 1978, 53-10192[U]
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C 2 Claims



1. A gel permeation chromatograph system which comprises:

a series of a solvent tank, a line filter and a distribution block;

a pair of series of constant flow feeding pumps and sample injecting devices which are connected in parallel to said distribution block for dividing into a sample side passage and a reference side passage;

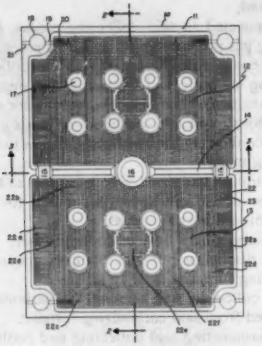
a pair of analysis columns adapted to contain high density gel in each passage; and

a detector connected to the outlet side passages of said analysis columns.

4,217,224
FILTER PLATE

William L. Fismer, Verona, and William A. Beach, Milltown, both of N.J., assignors to Envirotech Corporation, Menlo Park, Calif.

Filed Nov. 28, 1978, Ser. No. 964,227
Int. Cl.[2] B01D *25/12*
U.S. Cl. 210—231 **13 Claims**



1. A filter plate for use in a filter press machine for separating solids from liquids, the filter press machine being of the type wherein a plurality of filter plates are pressed together in abutting relationship and filtration is accomplished through a filter cloth disposed between adjacent filter plates, comprising:

a. a generally planar inner face and a peripheral rim which extends completely about the margin of said inner face and is integral therewith to define the border of the plate, said rim extending above the plane of said inner face so that, when adjacent plates on a press are pressed together in abutting relationship, the rims of two adjacent plates form a liquid tight seal around said inner faces of the adjacent plates; and

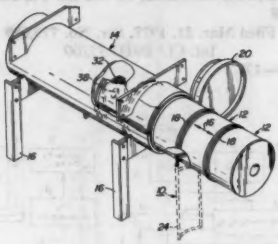
b. a transverse reinforcing bar which is raised from said planar inner face to the same extent as said rim and which extends laterally across said inner face from one side of the plate to the opposite side so that corresponding reinforcing bars of adjacent filter plates sealingly abut when the plates are pressed together, said reinforcing bar being integral with said rim at the opposite sides of the plate to divide said inner face into two distinct drainage areas, said reinforcing bar having formed therein at least one recess to provide liquid flow communication between said two drainage areas when adjacent filter plates are pressed together in abutting relationship.

4,217,225
CRADLE SYSTEM

Albert Jacobson, Huntingdon Valley, Pa., and Solomon Moskovitz, Margate, N.J., assignors to Miracle Core Chemical Industries, King of Prussia, Pa.

Filed Oct. 6, 1978, Ser. No. 949,203
Int. Cl.[2] B01D *35/16*
U.S. Cl. 210—236 **10 Claims**

1. In combination with a horizontal filter tank for enclosing cylindrical filter cartridges therein, first support means for said filter cartridges comprising a first set of spaced apart parallel members constructed and arranged for sliding movement along a lower portion of said filter tank in an axial direction thereof, second support means for said filter cartridges comprising a second set of spaced apart parallel members for said filter cartridges, said first and second sets of spaced apart parallel members being axially aligned with rotational connecting means connecting an end of said first support means with an adjacent end of said second support means, at least one cylindrical filter cartridge constructed and arranged with a

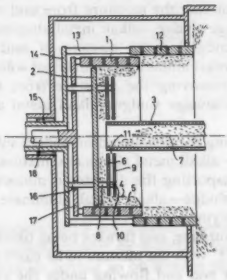


horizontal axis thereof paralleling said parallel members and supported by said members.

4,217,226
PUSHER CENTRIFUGE

Yves Kämpeen, Oberglatt; Bernd Hoppe, Weiningen, and Ernst Rebsamen, Thalwil, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Oct. 31, 1978, Ser. No. 956,421
Claims priority, application Switzerland, Nov. 25, 1977, 14407/77
Int. Cl.[2] B01D *33/10, 35/16*
U.S. Cl. 210—376 **8 Claims**



1. In a pusher centrifuge having a perforated centrifuge drum, a pusher plate, an inlet pipe opening out coaxially with the centrifuge drum and a guiding wall for the centrifuging mixture to be fed onto the centrifuge drum, the said guiding wall extending from the inlet pipe to the inner surface of the layer of centrifuging mixture laying on the centrifuge drum, and between the pusher plate and the guiding wall there is a flow space, substantially free from components, for the centrifuging mixture; the improvement that the surfaces of the pusher plate and the guiding wall which bound said flow space face exclusively in directions other than toward the axis of the drum.

4,217,227

SEMIPERMEABLE MEMBRANES OF COPOLYAMIDES

Klaus Elfert, Krefeld; Gerhard D. Wolf, Dormagen; Francis Bentz, Cologne, and Hans E. Kunzel, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 747,211, Dec. 3, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,271

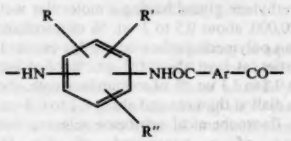
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554932

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—500 M 13 Claims

1. A porous semipermeable membrane for inverse osmosis and ultra filtration of highly-concentrated salt solutions consisting essentially of a fully aromatic copolyamide of

(A) 10 to 90% of units corresponding to the formula (I)



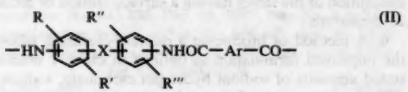
(I)

in which

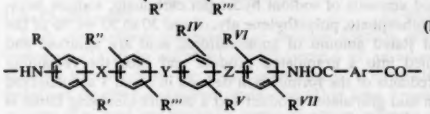
R, R′ and R″ which may be the same or different represent hydrogen, C_{1-4}-alkyl, or halogen, and

Ar represents an alkyl- or halogen-substituted by-valent aromatic radical or an unsubstituted aromatic radical and of

(B) 10 to 90 mole % of units corresponding to formulae II or IV below



(II)



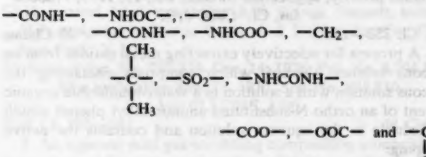
(IV)

in which

R, R′, R″, R‴, R^{IV}, R^{V}, R^{VI} and R^{VII} which may be the same or different represent hydrogen, C_{1-4}-alkyl or halogen,

Ar is as just defined, and

X, Y and Z which may be the same or different represent a direct bond or a bridge member corresponding to a member selected from the group consisting of



the physical properties of said membrane being a water absorption capacity of from 4.5 to 10% by weight, measured on approximately 40μ thick films at room temperature and at 65% relative air humidity; a through-flow of at least 80 l/m^2d for a desalination level of at least 85% as measured in a pressure osmosis apparatus in which a 3.5% NaCl-solution is pumped in a circuit past the surface of the membrane at room temperature under a pressure of 110 bars at a rate of 15 l/h and consisting of a fully aromatic copolyamide with a relative viscosity of ≧1.4, as measured on a 0.5% N-methyl pyrrolidone solution at 20° C.

4,217,228

TEXTILE FIBER FINISHES

Götz Koerner, Essen, and Hans Rott, Gladbeck, both of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Feb. 21, 1979, Ser. No. 13,250

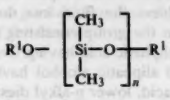
Claims priority, application United Kingdom, Feb. 23, 1978, 07345/78

Int. Cl.[2] D06M *15/66*

U.S. Cl. 252—8.6 7 Claims

1. A textile fiber finish comprising:

1 to 99 weight percent of compounds having the formula



(II)

wherein

R^1 is 15 to 96 mole percent of hydrogen and 85 to 4 mole percent trialkylsilyl, triarylsilyl, tri(alkylaryl)silyl, phenyl, monoalkylphenyl, dialkylphenyl, trialkylphenyl, the sum of the total carbon atoms in the alkyl linked to the phenyl being no more than 12;

n is 3 to 30; and

99 to 1 weight percent of conventional finish components.

4,217,229

OIL WELL SPACER FLUIDS

Jimmie L. Watson, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 725,068, Sep. 20, 1976, Pat. No. 4,141,843. This application May 1, 1978, Ser. No. 901,385

The portion of the term of this patent subsequent to Feb. 20, 1996, has been disclaimed.

Int. Cl.[2] E21B *43/00*

U.S. Cl. 252—8.55 R 3 Claims

1. A method of preparing a high stability, high density fluid comprising adding in order with mixing to the volume of water calculated to produce the desired volume of high density fluid; a dispersant comprising a condensation product of naphthalene sulfonate and formaldehyde; a relatively inert water-insoluble finely divided particulate weighting agent having a mean particle size in the range of about 2–20 microns; a viscosifier comprising a hydratable substituted hydroxy alkyl cellulose polymer wherein the hydroxy alkyl substituents have 2–3 carbon atoms; and as an inhibitor which is present in an effective concentration to inhibit clay swelling at least one water soluble halide salt of alkali metal, alkaline earth metal or ammonium.

4,217,230

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,050

Int. Cl.[2] E21B *43/22*

U.S. Cl. 252—8.55 D 10 Claims

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble polymer consisting of repeating units of vinyl sulfonic acid alkoxylated with about 2 to 200 weight percent of 2,3-epoxy-1-propanol,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well, and wherein the number average molecular weight of the said water-soluble polymer is about 10,000 to about 2,000,000.

4,217,231

LOW FLUID LOSS FOAM

George E. King, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 782,213, Mar. 28, 1977, abandoned. This application Aug. 14, 1978, Ser. No. 933,371

Int. Cl.[2] E21B *43/26, 43/27*

U.S. Cl. 252—8.55 R **10 Claims**

1. A method for hydraulic fracturing of a well formation comprising the step of injecting into a well under high pressure sufficient to fracture the formation an aqueous foam containing an additive which reduces the fluid loss during hydraulic fracturing selected from the group consisting of an unsubstituted monocarboxylic aliphatic acid having five to ten carbon atoms, an unsubstituted aliphatic alcohol having five to ten carbon atoms, malonic acid, lower n-alkyl diesters of malonic acid and their mixtures.

4,217,232

ANTIOXIDANT COMPOSITIONS

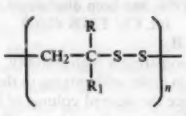
Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 21, 1978, Ser. No. 971,979

Int. Cl.[2] C10M *1/54*

U.S. Cl. 252—46.4 **12 Claims**

1. A composition comprising a major proportion of an oil of lubricating viscosity or grease prepared therefrom and a minor proportion sufficient to impart antioxidant properties thereto of material soluble therein consisting of the reaction product of a polydisulfide having at least one unit with the following structure:



where n is from about 2 to 20 and R and R_1 are hydrogen or C_1–C_{10} alkyl and a hydrocarbylmagnesium halide compound having the following structure: RMgX where R is alkyl, cycloalkyl or aryl having from 1 to about 30 carbon atoms and X is a halide.

4,217,233

EPITHIO COMPOUNDS AS ADDITIVES FOR LUBRICANTS

Peter Michaelis, Lindenfels, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

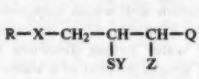
Filed Aug. 22, 1978, Ser. No. 935,815

Claims priority, application Switzerland, Aug. 31, 1977, 10609/77

Int. Cl.[2] C10M *1/20, 1/38;* **C07D** *327/02*

U.S. Cl. 252—48.2 **7 Claims**

1. An epithio compound of the formula I



(I),

wherein X is an oxygen or sulfur atom, Y and Z are together a direct bond, Q is hydrogen and R is branched or unbranched alkyl of 8 to 22 carbon atoms.

4,217,234

DENTURE CLEANSING TABLET AND METHOD OF MANUFACTURING THE SAME

Werner Krisp, Heinestrasse 9, 6940 Weinheim, and Mira Reuss, Nietzschestrass 4, 6800 Mannheim, both of Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,277

Int. Cl.[2] C11D *3/065, 7/18, 17/00*

U.S. Cl. 252—99 **12 Claims**

1. A denture-cleansing tablet of single layer structure for use in an aqueous solution for cleansing dentures wherein the tablet is formed from a formulation containing about 15 to 25 wt. % of sodium hydrogen carbonate, about 10 to 12 wt. % of sodium hexametaphosphate, about 5.5 to 7.5 wt. % of acid disodium pyrophosphate, about 20 to 24 wt. % of a salt of Caro's Acid, about 15 to 30 wt. % of amidosulfonic acid, about 2 to 6 wt. % of ethylene diamine tetraacetic acid, about 1 to 4 wt. % of a polyethylene glycol having a molecular weight of about 4,000 to 20,000, about 0.5 to 2 wt. % of a sodium polyacrylate which is a polymeric surface-active dye carrier having cleansing properties, at least about 0.5 wt. % of at least one surfactant, about 0.8 to 1.1 wt. % of sodium benzoate, about 1.5 to 2.5 wt. % of a dialkyl thiourea and about 0.2 to 0.5 wt. % of a non-ionogenic fluorochemical substance selected from the group consisting of a compound of the formula $C_8F_{15}O(CH_2CH_2O)nCH_3$ wherein C_8F_{15} is the residue of the tetramer of tetrafluoro ethylene and n has an average value of 8 and a compound of the formula $C_8F_{15}O(CH_2CH_2O)nC_8F_{15}$ wherein C_8F_{15} is the residue of the tetramer of tetrafluoro ethylene and n has an average value of 23, whereby the pH in a 1% solution of such tablet in water is 6.3 to 6.5, said denture tablet being characterized by a total decomposition time of about 1 to 2 minutes and a total denture-cleansing time of about 3 to 5 minutes and said denture-cleansing solution formed on dissolution of the tablet having a surface tension of about 25 to 26 dynes/cm.

6. A method of producing a denture-cleansing tablet from the improved formulation as defined in claim 1 wherein the stated amounts of sodium hydrogen carbonate, sodium hexametaphosphate, polyethylene glycol and 30 to 50 wt. % of the total stated amount of aminosulfonic acid are admixed and formed into a granulated product and then the remaining ingredients of the formulation defined in claim 1 are admixed with said granulated product and a denture-cleansing tablet is formed from the resultant mixture.

4,217,235

PROCESS FOR THE SELECTIVE EXTRACTION OF METAL CATIONS FROM AQUEOUS SOLUTIONS THEREOF AND COMPOSITIONS

Bengt G. Karlsson, Stenungsund, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

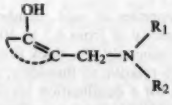
Filed Jul. 10, 1978, Ser. No. 923,121

Claims priority, application Sweden, Jul. 11, 1977, 7708033

Int. Cl.[2] C02C *5/02*

U.S. Cl. 252—184 **29 Claims**

1. A process for selectively extracting metal cations from an aqueous solution thereof, which comprises contacting the aqueous solution with a solution in a water-immiscible organic solvent of an ortho-N-substituted aminomethyl phenol which is insoluble in the aqueous solution and contains the active grouping:



wherein the two carbon atoms within the dashed ring represent part of an aromatic carbocyclic ring; R_1 and R_2 are selected from the group consisting of hydrogen and hydrocarbon

groups having from one to about twelve carbon atoms and including monovalent hydrocarbon groups and bivalent hydrocarbon groups having from about four to about twelve carbon atoms in which R_1 and R_2 are taken together with the nitrogen to form a heterocyclic ring having from five to about thirteen ring atoms.

4,217,236

PROCESS AND COMPOSITION FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 768,421, Feb. 14, 1977, Pat. No. 4,101,633. This application Sep. 22, 1977, Ser. No. 835,773

Int. Cl.² C09K *3/00*

U.S. Cl. 252—189 **10 Claims**

7. An amine composition comprising an aqueous mixture of (a) at least about 50 mol % of 2-amino-2-methyl-1-propanol, and (b) at least about 10 mol % of a tertiary amino alcohol selected from the group consisting of N-methyl diethanolamine, 2-dimethylamino ethanol, 3-dimethylamino-1-propanol and 1-dimethylamino-2-propanol.

4,217,237

PROCESS FOR REMOVING CARBON DIOXIDE CONTAINING ACIDIC GASES FROM GASEOUS MIXTURES USING A BASIC SALT ACTIVATED WITH A HINDERED AMINE

Guido Sartori, Linden, N.J., and Frederic Leder, Corona Del Mar, Calif., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 862,196, Dec. 19, 1977, Pat. No. 4,112,050, and a continuation-in-part of Ser. No. 590,427, Jun. 26, 1975, abandoned. This application May 30, 1978, Ser. No. 910,861

Int. Cl.² C09K *3/00*

U.S. Cl. 252—192 **12 Claims**

1. A composition comprising an aqueous solution which comprises (1) 10 to about 40 weight percent of an alkaline material selected from the group consisting of a basic alkali metal salt or alkali metal hydroxide, and (2) at least 2 weight percent of at least one sterically hindered amine, wherein said sterically hindered amine is defined as containing at least one secondary amino group attached to either a secondary or tertiary carbon atom or a primary amine group attached to a tertiary carbon atom and selected from the group consisting of: aminoethers, aminoalcohols, di- and triamines.

4,217,238

PROCESS FOR REMOVING ACID GASES WITH HINDERED AMINES AND AMINO ACIDS

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 750,520, Dec. 14, 1976, Pat. No. 4,094,957. This application Sep. 22, 1977, Ser. No. 835,810

Int. Cl.² C09K *3/00*

U.S. Cl. 252—192 **11 Claims**

1. An aqueous acid gas scrubbing composition comprising a mixture of (a) from about 10 to about 40% by weight of a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and (b) an activator system for the basic alkali metal salt or hydroxides comprising (i) at least one sterically hindered amine containing at least one secondary amino group attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom and (ii) from about 2 to about 20% by weight of a tertiary or sterically hindered aminoacid containing 4 to 8 carbon atoms and being free of any hydroxyl groups.

4,217,239

COMPOSITION FOR SCINTILLATION COUNTING

Jozsef Kelemen, Basel, Switzerland; Eickhard Kühl, Rheinfelden-Eichsel, Fed. Rep. of Germany, and Karl Schmid, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,271

Claims priority, application Switzerland, Feb. 22, 1978, 1919/78; Dec. 28, 1978, 13256/78

Int. Cl.² G01T *1/20*; F21K *2/00*

U.S. Cl. 252—301.17 **9 Claims**

1. A composition for scintillation counting containing a scintillator active substance and an effective amount for reducing the light sensitivity of the scintillator active substance, of a stabilizer which is an organic compound of divalent sulfur or mixtures thereof, selected from the groups consisting of

(a) aromatic or heterocyclic mercaptans, having a dissociation constant greater than that of phenol; and

(b) sulfides of the formula

$$R_1—S—R_2$$

wherein each of R_1 and R_2 independently represents an aliphatic radical of 1 to 8 carbon atoms, or R_1 and R_2 together with the sulfur atom to which they are attached, form a saturated aliphatic 5- or 6-membered ring.

4,217,240

STABLE ALUMINOSILICATE AQUASOLS HAVING UNIFORM SIZE PARTICLES AND THEIR PREPARATION

Horacio E. Bergna, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 809,362, Jun. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 719,717, Sep. 2, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,397

Int. Cl.² B01J *13/00*

U.S. Cl. 252—313 S **6 Claims**

1. A stable aluminosilicate aquasol having uniform size particles ranging from 3 to 90 nanometers in diameter with a molar ratio of Si:Al of 1:1 to 19:1, said uniformity defined by particles having a maximum standard deviation of 0.37d where d is the weight average particle size diameter.

4. A method for the preparation of a stable amorphous aluminosilicate sol having uniform, spheroidal, discrete, colloidal particles in the range of 3 to 90 nanometers comprising

(a) preparing a heel sol of discrete colloidal particles selected from the group consisting of sodium, potassium or ammonium aluminosilicate, silica and one or more refractory oxides selected from the group consisting of alumina, zirconia, lanthana, thoria, titania and rare earth oxides, said particles having a substantially uniform diameter within the range of 2 to about 85 nanometers, said aluminosilicate having a molar ratio of Si:Al of from 1:1 to 19:1, the initial concentration in the heel sol of sodium, potassium, ammonium aluminosilicate or refractory metal oxide being at least 0.2% by weight, with the particles stabilized against aggregation in the pH range 9 to 12;

(b) adding to said heel, separately but simultaneously, two feed solutions, one being a solution of sodium or potassium silicate having from one to 36 grams of silica per 100 cc, or a sol of silicic acid containing from 1 to 12% silica, the other being a solution of sodium or potassium aluminate containing from 1 to 15% alumina, said feed solutions being added in relative rates and proportions to maintain a constant molar ratio of Si:Al in the feed streams of from 1:1 to 19:1 with the rate of addition of silica not to exceed 10 grams of SiO_2 per 1000 square meters of total surface area of particles in the heel sol per hour;

(c) maintaining the pH of the heel sol at a constant value between 9 and 12 by adding cation exchange resin in the hydrogen or ammonium form, maintaining the tempera-

ture of the heel sol at from 50° to 100° C. until the particles in the heel sol have attained an increase in diameter of at least 1 nanometer and a maximum size of 90 nanometers; and

(d) filtering the sol from (c) to remove cation exchange resin and optionally concentrating the sol to a solids content of up to 60% by weight.

4,217,241
PROCESS FOR THE MICROCAPSULATION OF ORGANOPHOSPHORIC ACID DERIVATIVE-CONTAINING AGRICULTURAL CHEMICALS

Yoshio Okada, Tokyo; Yuriko Igarashi, Mitaka, and Kozyu Watanabe, Itabashi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1978, Ser. No. 893,822
Claims priority, application Japan, Apr. 8, 1977, 52-39575
Int. Cl.² B01J *13/02*
U.S. Cl. 252—316 **2 Claims**

1. A process for the production of microcapsules having a permanent outer shell consisting essentially of a material selected from the group consisting of a polycation colloid and a polyanion colloid and having a capsule core substance consisting essentially of an organo-phosphoric acid derivative, said process comprising the steps of:

(a) adding from about 0.1 to 10 parts by weight of a hydrophobic polymer selected from the group consisting of polymethyl methacrylate, polystyrene, polyvinyl chloride and polyvinyl acetate to 100 parts by weight of said core substance;

(b) dispersing and emulsifying the resulting core substance-polymer mixture in an aqueous medium to produce microdroplets provisionally covered with a layer composed of said hydrophobic polymer;

(c) subjecting the microdroplets to the conventional complex coacervation process to form capsules having an outermost solid membrane layer on each of said provisionally coated droplets;

(d) separating the capsules from the dispersion phase; and

(e) drying the resultant capsules whereby the provisional, hydrophobic polymer layer dissolves into the core substance to produce mono-layer capsules.

4,217,242
PROCESS FOR PREPARING AN IMPROVED ANTI-OXIDANT GUM COMPOSITION FOR LITHOGRAPHIC PLATES

Cromwell D. Mukai, Berkeley Heights, N.J., assignor to Polychrome Corporation, Yonkers, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,697
Int. Cl.² C09K *15/32;* **C23F** *11/16;* **B41C** *1/10*
U.S. Cl. 252—389 A **14 Claims**

1. A method of producing a gum composition capable of effectively preventing the oxidation of aluminum surfaces under ambient atmospheric conditions which comprises the steps of,

a. blending an aqueous solution of a gum arabic with a mineral acid so as to obtain a pH of about 2.0 or less;

b. heating the solution at a temperature just below its boiling point until a viscosity of from about 1.5 to about 10 centipoises is obtained;

c. elevating the pH to from about 3 to about 10.5 with a compatible base material;

d. adding a suitable preservative composition;

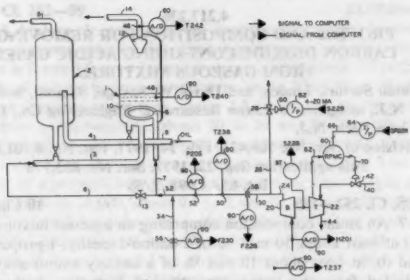
e. adding a compatible surfactant;

f. removing suspended particles from the mixture.

4,217,243
CATALYST REGENERATOR CONTROL

David A. Christie, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1976, Ser. No. 681,979
Int. Cl.² B01J *29/38, 21/20;* **C10G** *11/18, 11/04*
U.S. Cl. 252—419 **12 Claims**



1. In a method for regenerating a coke-deactivated cracking catalyst by burning off said coke from said deactivated cracking catalyst with air in a catalyst regeneration zone the improvement which comprises

A. controlling the flow of said air into said regeneration zone in a main air line into the regeneration zone and in a side air line, said side air line being in fluid communication with said main air line or said regeneration zone,

B. controlling the flow of air in said side air line within a side air control range responsive to the actual flow of air into the regeneration zone and to a desired total air flow signal established responsive to temperature conditions in the regeneration zone,

C. controlling the flow of air in the main air line at a normally constant value, said normally constant value being adjusted to a new normally constant value responsive to the control of the side air line whenever

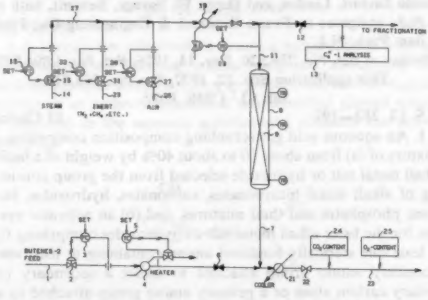
a. the flow of air in said side air line exceeds said side air control range and

b. at least a set minimal time has elapsed since the last change of said normally constant value.

4,217,244
REGENERATION OF ISOMERIZATION CATALYSTS CONTAINING MAGNESIUM OXIDE

Dean P. Montgomery, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1978, Ser. No. 905,074
Int. Cl.² B01J *21/20;* **C07C** *5/30*
U.S. Cl. 252—419 **3 Claims**



1. A method for regenerating a used catalyst consisting essentially of magnesium oxide, which has been used to isomer-

ize butene-2 to butene-1, which comprises purging the used catalyst with an inert gas at a temperature substantially below about 1000° F., to remove substantially any hydrocarbon remaining in the catalyst, then passing an oxygen-containing gas, together with said inert gas, the mixture to contain not more than about 0.5 volume percent O_2, through the catalyst, controlling the rate of flow of said mixture to maintain the catalyst at a localized bed temperature not exceeding substantially about 1000° F., now increasing the O_2 content of the mixture gradually but not sufficiently to substantially exceed said temperature of about 1000° F., continuing to pass O_2-containing gas through the catalyst until substantially no more carbon dioxide exits the catalyst bed in the off-gas therefrom, then stopping the flow of O_2 to the catalyst, continuing to pass said inert gas through said catalyst bed until substantially all O_2 has been purged from said catalyst bed and then removing any traces of water or steam from said catalyst prior to its reuse and then reusing said catalyst.

4,217,245

CHEMICAL COMPOSITIONS BASED ON TITANIUM TRIHALIDES, METHOD FOR THEIR PREPARATION AND THEIR USES

Margherita Corbellini, Milan; Alessandro Gamba, Dalmine, and Carlo Busetto, Padova, all of Italy, assignors to Snamprogetti, S.p.A., San Donato Milanese, Italy

Filed Jun. 2, 1978, Ser. No. 911,920
Claims priority, application Italy, Jun. 30, 1977, 25233 A/77
Int. Cl.² C08F *4/64*
U.S. Cl. 252—429 B **10 Claims**

1. A composition based on titanium trihalide and a halide of one or more metals selected from the group consisting of Mg, Al, Ti, Zr, Mo, V, Mn, Cr, Fe and Zn, characterized in that it is prepared by reacting a tetravalent titanium compound, which tetravalent titanium compound has previously been anchored to a solid supporting member, with the vapor of one or more of said metals, in the presence, or not, of a halogenated compound selected from the group consisting of an organic halogen of the formula $C_m H_{2m+2-x} X_x$ wherein X is a chlorine or bromine, m is a number from 1–18, x is a number from 1–4, and a high valency halide of an element capable of existing in at least two states of valency.

4,217,246

METHOD FOR THE HYDROGENATION OF AROMATIC SUBSTRATES AND MEANS THEREFOR

Giovanni Dozzi, Milan, and Salvatore Cucinella, San Donato Milanese, both of Italy, assignors to NIC, S.p.A., Palermo, Italy

Filed Jun. 30, 1978, Ser. No. 921,002
Claims priority, application Italy, Jul. 27, 1977, 26190 A/77
Int. Cl.² B01J *31/14, 31/30*
U.S. Cl. 252—429 B **5 Claims**

1. A catalyst system for the hydrogenation of unsaturated compounds, composed by:

(a) a metal selected from the group consisting of the metals of the Groups IIA and IIIA of the Periodic System,

(b) a primary or a secondary amine,

(c) a halide selected from the group consisting of the halides of cobalt and nickel, and

(d) an activator selected from Na, NaH, Na Al H_4, Al Et_3 or Mg Et_2 and wherein the molar ratio of (a) to (b) is nearly 1, of (a) to (c) is between 0.1 and 100, and of (d) to (a) is near 0.05 or less.

4,217,247

CATALYST SYSTEM FOR POLYURETHANE FOAMS

John F. Szabat; Gert F. Baumann, both of Pittsburgh, and Gaeta L. Copeland, Eighty Four, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1979, Ser. No. 17,997
Int. Cl.² B01J *27/24*
U.S. Cl. 252—431 C **9 Claims**

1. A catalyst composition comprising

(a) 0.4% to 99.2% by weight of a tertiary amine,

(b) 0.4% to 98.8% by weight of a tin compound capable of catalyzing the reaction between an isocyanate group and an active hydrogen atom, and

(c) 0.09% to 99.2% by weight of a compound of the formula:

$$(R\text{-}COO\rightarrow)_2 Me$$

wherein Me represents calcium or barium, and

R represents a hydrocarbon group,

all weight percents being based on the total catalyst compounds present.

9. A catalyst composition comprising

(a) 0.4% to 99.2% by weight of a tertiary amine,

(b) 0.4% to 98.8% by weight of a tin compound capable of catalyzing the reaction between an isocyanate group and an active hydrogen atom, and

(c) 0.09% to 99.2% by weight of barium acetylacetonate,

all weight percents being based on the total catalyst compounds present.

4,217,248

HYDROALKYLATION CATALYST COMPOSITION COMPRISING A RHENIUM, NICKEL, RARE EARTH ZEOLITE

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 866,440, Jan. 3, 1978, Pat. No. 3,152,362.
This application Feb. 16, 1979, Ser. No. 12,785
Int. Cl.² B01J *29/04, 29/08*
U.S. Cl. 252—455 Z **7 Claims**

1. A composition consisting essentially of:

at least one rhenium compound supported on a calcined, acidic nickel and rare earth metal-treated crystalline zeolite wherein the elemental rhenium content is within the range of 0.01 to about 1 percent by weight of the composition; wherein the elemental nickel content is within the range of about 0.01 to about 15 percent by weight of the composition; wherein the elemental rare earth content is within the range of about 2 to about 25 percent by weight of said composition; and wherein said zeolite is selected from the group consisting of type X, type L, and type Y zeolites.

4,217,249

SUPPORTED HETERONUCLEAR NOBLE METAL CLUSTER CATALYSTS AND METHOD FOR PREPARING SAME

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 13, 1978, Ser. No. 924,161
Int. Cl.² B01J *23/62, 23/82*
U.S. Cl. 252—466 PT **11 Claims**

1. Supported platinum-iridium cluster catalysts prepared by the reduction of a supported Pt-Ir cluster complex, said cluster complex being selected from the group consisting of

(pyridine)$_2$ Pt[$Ir_6(CO)_{15}$]

(pyridine)$_2$ Pt[$Ir_2(CO)_7$]

$((C_6H_5)_3P)_2Pt[Ir(CO_3)P(C_6H_5)_3]_2$

wherein the supported reduced platinum-iridium clusters correspond to the stoichiometries $PtIr_6$, $PtIr_2$, and $PtIr_2$, respectively.

3. Supported rhodium-iridium cluster catalysts prepared by

the reduction of a supported, rhodium-iridium cluster complex, said cluster complex being of the formula:
$((C_6H_5)_3P)_2Rh(CO)[Ir(CO)_4]$.

4,217,250

PROCESS FOR THE STABILIZATION OF PERFUMES

Günter Holzner, Grand-Lancy, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed May 16, 1978, Ser. No. 906,659

Claims priority, application Switzerland, May 24, 1977, 6377/77

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 R **5 Claims**

1. In a method for stabilizing a perfume, perfume base or perfuming ingredient against the adverse effects of the presence of traces of heavy metals including iron and copper, the improvement which consists of adding to said perfume, perfume base or perfuming ingredient, at a weight concentration of from about 0.5 to 25% based on the total weight of the stabilized perfume, perfume base or perfuming ingredient, a liposoluble non-ionic, heavy metal complexing agent selected from (i) a copolymer of ethylene and propylene oxide with ethylene diamine or (ii) an organic ester derived from phosphoric or phosphonic acid and an ethoxylated fatty alcohol.

4,217,251

NOVEL CYCLOPENTANONE DERIVATIVES USED AS PERFUME INGREDIENTS

Khurshid P. Dastur, Satigny, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

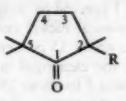
Division of Ser. No. 793,287, May 3, 1977, Pat. No. 4,173,584. This application May 11, 1979, Ser. No. 38,181

Claims priority, application Switzerland, May 13, 1976, 5995/76

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 R **2 Claims**

1. A process for improving, modifying or enhancing the odoriferous properties of perfume compositions which comprises the step of adding to said materials an effective amount of a compound of formula



[I]

wherein symbol R represents an alkyl comprising from 4 to 6 carbon atoms.

4,217,252

PERFUME COMPOSITIONS CONTAINING 1-ACYL-2,6,6-TRIMETHYLCYCLOHEXENE DERIVATIVES

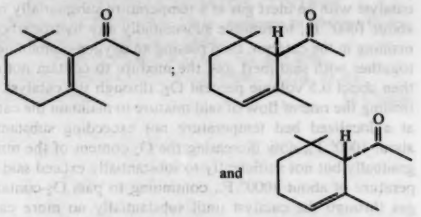
Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; Robin Kasper, Eatontown; Manfred H. Vock, Locust; Joaquin Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 965,418, Dec. 1, 1978, Pat. No. 4,172,850. This application May 15, 1979, Ser. No. 39,193

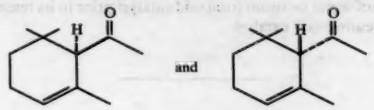
Int. Cl.² C11B 9/00

U.S. Cl. 252—522 R **3 Claims**

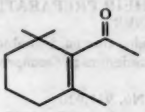
1. A process for augmenting or enhancing the aroma of a perfume composition comprising the step of adding to a perfume composition an aroma augmenting or enhancing quantity of a mixture consisting essentially of compounds having the structures:



wherein the mixture contains 30% of the compounds having the structures:



and 60% of the compound having the structure:



4,217,253

MIXTURE OF 3-METHYL-1-PHENYL-PENTANOL-5 OR ITS ISOMERS AND BUTANOYL CYCLOHEXANE DERIVATIVES

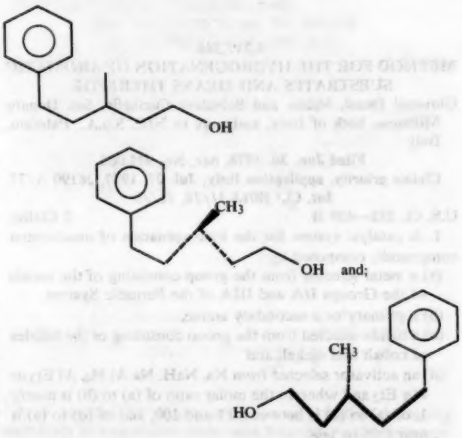
Frederick L. Schmitt, Holmdel, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 949,140, Oct. 6, 1978. This application Jul. 13, 1979, Ser. No. 57,357

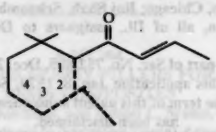
Int. Cl.² C11B 9/00; A61K 7/46

U.S. Cl. 252—522 R **1 Claim**

1. A mixture consisting essentially of the 3-methyl-1-phenyl-pentanol-5 or stereoisomer thereof having a structure selected from the group consisting of:



and intimately admixed therewith a cyclohexylbutenone derivative having the structure:



wherein one or two of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon carbon single bond with the proviso that when two of the dashed lines are carbon-carbon doubles said carbon-carbon double bonds are conjugated and wherein the ratio of 3-methyl-1-phenyl-pentanol-5:cyclohexylbutenone derivative is from about 1:10^{-7} to about 1:0.1.

4,217,254

HIGH GREEN STRENGTH CURABLE URETHANE ADHESIVE

Norris R. Legue, Scotch Plains, N.J., assignor to Synthetic Surfaces, Inc., Scotch Plains, N.J.

Filed Dec. 20, 1978, Ser. No. 971,450

Int. Cl.[2] C08L *15/02, 91/00*

U.S. Cl. 260—3.3 **18 Claims**

1. A curable adhesive composition consisting essentially of a solution in a suitable solvent of

(a) an isocyanate terminated ricinoleate prepolymer having an available isocyanate content exclusive of solvent and expressed as 100% solids at least as high as 2% by weight, and

(b) a chlorinated rubber having approximately 63% to 68% by weight chlorine, the chlorinated rubber appearing in quantities no more than approximately 70% by weight of the mixture of chlorinated rubber and the said prepolymer.

4,217,255

COMPOSITION RAILROAD FRICTION MATERIAL WITH SYNTHETIC FIBER CONTENT

Arvon M. Griffith, Valley Cottage, N.Y., assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 815,637, Jul. 14, 1977, abandoned. This application Apr. 16, 1979, Ser. No. 30,411

Int. Cl.[3] C08L *1/02;* **F16D** *69/00*

U.S. Cl. 260—17.2 **16 Claims**

1. An asbestos-free and lead-free composition friction material, comprising, by weight, 0.5–11% fiber, of which at least 0.5% is synthetic fiber, 66–81% filler and 14–21% organic binder.

4,217,256

POLYAMIDE ADHESIVE FOR BONDING FABRICS

Dwight E. Peerman, Minnetonka, and H. Gordon Kanten, Minneapolis, both of Minn., assignors to Henkel Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 876,601, Feb. 10, 1978, abandoned. This application Aug. 31, 1978, Ser. No. 938,683

Int. Cl.[3] C08L *77/08*

U.S. Cl. 260—18 N **14 Claims**

1. A polyamide adhesive adapted for bonding of fusible interliners for fabrics which are cleanable comprising a polymeric fat acid terpolyamide having a melt index at 175° C. of at least 30 and a melt viscosity of not more than 125 poises at 220° C. and a tensile secant modulus not more than about 45,000, said terpolyamide being the thermal amidification product at a temperature of about 100°–300° C. for a time sufficient to effect amidification of

(a) caprolactam, amino-caproic acid or mixtures thereof,

(b) hexamethylene diamine and

(c) a mixture of a polymeric fat acid and an aliphatic straight chain co-dicarboxylic acid having 10–12 carbon atoms

wherein substantially equal amounts of amine and carboxyl are employed to provide a terpolyamide product wherein the caprolactam is present in an amount of 25–30% by weight, the polyamide of said hexamethylene diamine and said polymeric fat acid is present in an amount of 45–55% by weight and the polyamide of said hexamethylene diamine and said co-dicarboxylic acid is present in an amount of 20–25% by weight of the terpolyamide.

4,217,257

ALKYD RESINS WITH USE OF MULTIFUNCTIONAL MONOMERS

Edward J. Kuzma, Woodbridge, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 832,774, Sep. 13, 1977, abandoned, which is a continuation of Ser. No. 660,738, Feb. 23, 1976, abandoned. This application Feb. 8, 1979, Ser. No. 10,200

Int. Cl.[2] C09D *3/66*

U.S. Cl. 260—22 CB **9 Claims**

1. An improved alkyd resin comprising the reaction product of:

(1) a polycarboxylic acid or a polycarboxylic acid anhydride,

(2) a partial or complete ester of (a) a polyol having at least two hydroxyl groups with (b) a monobasic fatty acid derived from a naturally-occurring glyceride, and

(3) from 0.5 to 10% by weight, based on the total weight of said reaction product, of an acrylic or methacrylic acid ester of a polyol in which at least two hydroxyl groups are esterified.

4,217,258

STABILIZED HALOGEN-CONTAINING RESIN COMPOSITION

Motonobu Minagawa, Koshigaya; Tetsuo Sekiguchi, Hasuda, and Kenji Nakazawa, Urawa, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.

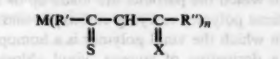
Filed Apr. 27, 1979, Ser. No. 33,570

Claims priority, application Japan, Apr. 28, 1978, 53-51448

Int. Cl.[2] C08K *5/58, 5/36*

U.S. Cl. 260—23 XA **16 Claims**

1. A stabilizer composition for increasing the resistance to yellowing and loss of clarity upon heating at 175° C. of a vinyl halide polymer, comprising (A) at least one thio-1,3-dicarbonyl compound represented by the formula



in which M represents a hydrogen atom, an organotin group, or one of the metals Li, Na, K, Mg, Ca, Sr, Ba, Zn, Al, Sb, Ni, Sn, Cu or Zr; R represents a hydrogen atom, an alkyl group, an aryl group, an alkaryl group, an aralkyl group, an alkenyl group, or a group

R′, R″ and R‴ each independently represent a hydrogen atom, an alkyl group, an alkenyl group, an alkoxyaryl group, an alkaryl group, an aralkyl group, a cycloalkyl group, or a cycloalkenyl group, any of which can carry a halogen substituent; X independently at each occurrence is oxygen or sulfur; and n representing the valence of M is an integer from 1 to 4; and (B) at least one heat stabilizer which is an alkyltin compound or a metal salt of a non-nitrogeneous monocarboxylic acid having 6 to 24 carbon atoms or of a hydrocarbon-substituted phenol having 10 to 30 carbon atoms.

13. A stabilized vinyl chloride polymer composition comprising a vinyl chloride polymer and a stabilizer composition according to claim 1.

4,217,259

ASPHALTIC CONCRETE COMPOSITIONS COMPRISING DIENE/VINYL AROMATIC COPOLYMERS

Clarence R. Bresson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1977, Ser. No. 838,341
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS 21 Claims

1. An asphaltic concrete composition comprising an asphalt, a mineral aggregate, and a radial teleblock copolymer of a conjugated diene and a monovinyl aromatic monomer wherein the teleblock copolymer has a diene/monovinyl aromatic monomer weight ratio of at least about 75/25 to about 90/10 and a weight average molecular weight range of from about 150,000–300,000.

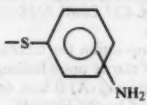
4,217,260

LATICES OF VINYL POLYMERS WHICH ARE STABLE IN ELECTROLYTES

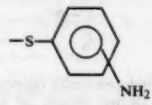
Jean-Claude Daniel, Fontenay-sous-Bois, and Nadine Jorio, Blaye, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jul. 24, 1978, Ser. No. 927,464
Claims priority, application France, Aug. 3, 1977, 77 23879
Int. Cl.[2] C08L *25/04*
U.S. Cl. 260—29.6 H 13 Claims

1. Latices of vinyl polymers comprising dispersions of particles of vinyl polymers with terminal



groups, in which the particles are made up of a core of vinyl and/or diene polymer carrying carboxylic and/or sulphonate groups, in which the vinyl polymer is a homopolymer of styrene or a derivative of styrene, vinyl chloride, vinylidene chloride, vinyl acetate or an acrylic derivative, or a copolymer of one or more such monomers with one another and/or with a modifying vinyl comonomer constituting up to 5% by weight of the copolymer, and a peripheral layer of vinyl polymer with terminal



groups, in which the vinyl polymer is a homopolymer of styrene or a styrene derivative, a C_{1-10} alkyl acrylate or methacrylate, acrylonitrile or methacrylonitrile, or a copolymer of one or more such monomers with one another and/or with a modifying vinyl comonomer constituting up to 5% by weight of the copolymer, and have an average diameter from 0.03 to 5 μm.

4,217,261

AIR DRYING THERMOSETTING AQUEOUS EPOXY-ACRYLIC COPOLYMER COATING SYSTEMS

Kazys Sekmakas, Chicago; Raj Shah, Schaumburg, and John D. DeRossi, Zion, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 752,805, Dec. 20, 1976, Pat. No. 4,133,790. This application Jan. 8, 1979, Ser. No. 1,749
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.[2] C08J *3/06*; C08L *33/02*
U.S. Cl. 260—29.6 NR 9 Claims

1. A method of providing a thermosetting aqueous epoxy resin-acrylic copolymer coating system adapted to cure on air drying comprising providing a mixture in water consisting essentially of a first component constituted by acid-neutralized organic solvent soluble tertiary amine copolymer of copolymerized monomers comprising at least about 60% of non-reactive monoethylenic monomer, and from 15–40% of monoethylenic tertiary amine monomer selected from the group consisting of esters and amides of monoethylenic carboxylic acids, said copolymer being in solution in a water-miscible inert organic solvent, and a second component constituted by a resinous polyepoxide in solution in at least partially water-miscible organic solvent.

4,217,262

PREPARATION OF A CATIONIC COPOLYMER

Anthony T. Coscia, S. Norwalk; Hans P. Panzer, Stamford, and Michael N. D. O'Connor, Norwalk, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 860,816, Dec. 15, 1977, abandoned. This application May 10, 1979, Ser. No. 37,618
Int. Cl.[2] C08L *33/02, 33/24*
U.S. Cl. 260—29.6 SQ 10 Claims

1. A process for preparing a cationic copolymer of improved performance characteristics, said copolymer comprising a major amount of a nonionic monomer and a minor amount of a cationic comonomer of greater reactivity than said nonionic monomer, said process comprising (1) preparing an aqueous solution of the total quantity of said nonionic monomer to be employed and up to about 95 mol percent of the total quantity of said cationic comonomer to be employed, thus providing a withheld portion of said cationic comonomer; (2) emulsifying said aqueous solution in a sufficient quantity of a hydrocarbon oil to provide a water-in-oil emulsion in which water comprises the dispersed phase; (3) initiating the polymerization reaction; and (4) continuing the polymerization while incrementally adding thereto said withheld portion of said cationic comonomer until substantially all of the nonionic monomer and cationic comonomer have reacted.

6. A water-in-oil emulsion of a cationic copolymer of improved performance characteristics prepared by the process of claim 1.

4,217,263

CHEMICALLY-RESISTANT ADHESIVES AND LABELS

Frank A. Magnotta, Framingham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 912,819, Jun. 5, 1978, Pat. No. 4,172,163. This application Feb. 5, 1979, Ser. No. 9,033
Int. Cl.[2] C08K *5/01*
U.S. Cl. 260—29.8 9 Claims

1. An adhesive composition comprising a styrene butadiene copolymer base, having a Mooney viscosity index in the range from about 35 to about 55, a non-hydrolyzable hard resin tackifier having a softening point in the range from about 80° C. to about 100° C., a non-hydrolyzable soft resin plasticizer having a softening point in the range from about 5° C. to about 10° C., and a stabilizer, said binder and tackifier being present in a weight ratio in the range from about 1:1 to about 1:1.5, said tackifier and plasticizer being present in a weight ratio in the

range from about 6:1 to about 15:1, and said stabilizer being present in a concentration of about 0.5% to about 3% by weight of the binder and tackifier combined.

4,217,264

MICROPOROUS GLASSY FILLERS FOR DENTAL RESIN COMPOSITES

Curtis P. Mabie, Thurmont, and Daniel L. Menis, Gaithersburg, both of Md., assignors to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 783,760, Apr. 1, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,308

Int. Cl.[2] **A61K** *5/06;* **C08K** *3/36;* **C08W** *33/12*

U.S. Cl. 260—42.15 **15 Claims**

1. In a dental resin composite comprising a resin and a filler material the improvement which comprises the replacement of at least a portion, if not all, of said filler material with a non-toxic, substantially uniform internally microporous glassy filler having a median refractive index between about 1.51 and about 1.64 and a density between about 2.37 and about 3.15 grams per cubic centimeter, said microporous glassy filler comprising a gelled, calcined sol comprised of refractory inorganic oxides including silica and alumina, and at least one non-toxic x-ray opacifying oxide selected from the group consisting of zirconium, hafnium, tantalum and tin oxides.

4,217,265

PIGMENT PREPARATIONS

Erwin Dietz, Kelkheim; Otto Fuchs; Robert Gutbrod, both of Frankfurt am Main; Adolf Kroh, Selters, and Michael Maikowski, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,437

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731175

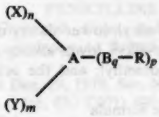
Int. Cl.[2] **C08J** *3/20;* **C09D** *3/00, 11/02;* **C09B** *67/00*

U.S. Cl. 260—42.21 **23 Claims**

1. A pigment preparation containing

(a) an organic pigment,

(b) a colorless or only slightly colored aromatic compound of the formula I



(I)

in which

A is an aromatic ring system having at least 9 ring atoms, more than one ring and being identical or similar to that part of the aromatic ring system of the pigment molecule,

B represents bivalent linking groups,

R represents aliphatic carbon chains of more than 5 carbon atoms which are unsubstituted or substituted by hydroxy and/or carboxy groups,

X and Y, independent of each other, represent —R', halogen, —OR', —NR'R", —COOR', —CONR'R", —SO_2NR'R", —NR'—CO—R", —NO_2, —CN, —CF_3 or SO_3M, M being an equivalent of a mono- to trivalent cation, and R' and R", independent of each other stand for H or a short-chain alkyl radical having from 1 to 4 carbon atoms, n and m, independent of each other, are 0, 1 or 2, p is an integer of from 1 to 4, and q is the integer 0 or 1.

4,217,266

PIGMENT PREPARATIONS

Alfred Pischtschan, Kuerten; Karlheinz Wolf, Leverkusen; Reinhold Hörnle, Cologne; Fritz Bremer, Leverkusen; Bernhard Arnold, Pulheim, and Werner Kullick, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 11, 1979, Ser. No. 2,792

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1978, 2801315

Int. Cl.[2] **C08K** *9/04*

U.S. Cl. 260—42.21 **14 Claims**

1. Pigment preparation containing a pigment, a non-ionic surface-active agent and, as a thermoplastic finishing agent, a copolymer which has an average molecular weight of 80,000 to 160,000 and consists of 90–50% by weight of α-methylstyrene and 10–50% by weight of acrylonitrile.

4,217,267

POLYMERIC PENTAERYTHRITYL PHOSPHONATES AND THEIR USE AS FLAME RETARDANTS

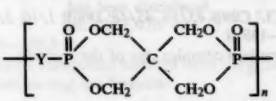
Joseph A. Hoffman, Bridgewater; Christos Savides, Piscataway, and John C. Oppelt, Bridgewater, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 28, 1978, Ser. No. 900,828

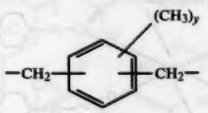
Int. Cl.[2] **C07F** *9/40;* **C08K** *5/53*

U.S. Cl. 260—45.75 D **5 Claims**

1. A flame retardant composition comprising a polyolefin polymer having about 2 to 4 carbon atoms and an effective flame retardant amount of a mixture of a polymeric pentaerythrityl phosphonate represented by the formula:



wherein Y is selected from (a) $-(CH_2)_x-$ or



(b)

and wherein n is at least 2; x is an integer from 1 to 8; and y is 0 to 4, and ammonium polyphosphate.

4,217,268

SYNTHESIS OF PEPTIDES

John L. Hughes, 9 Strasma Dr., Kankakee, Ill. 60901; Jay K. Seyler, 581 W. Drummond Dr., Bourbonnais, Ill. 60914, and Robert C. Liu, 1561 W. Merchan, Apt. 1-W, Kankakee, Ill. 60901

Filed Jul. 20, 1978, Ser. No. 926,573

Int. Cl.[2] **C07C** *103/52;* **A61K** *37/00;* **C08F** *37/00*

U.S. Cl. 260—112.5 T **5 Claims**

1. Des-X^2-calcitonin, where X is serine or glycine.

4,217,269

DIPEPTIDE CHROMOGENIC SUBSTRATES

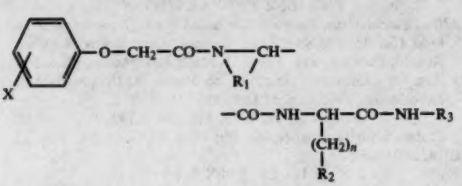
John W. Cole, Deerfield, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 23, 1979, Ser. No. 23,062

Int. Cl.[2] **C07C** *103/52;* **C07G** *7/00*

U.S. Cl. 260—112.5 R **7 Claims**

1. A compound of the formula



and the biologically acceptable acid addition salts thereof, wherein R_1 represents an alkylene having 2–4 carbon atoms; R_2 is selected from the group consisting of amino and guanyl; R_3 is selected from the group consisting of p-nitrophenyl, methylnitrophenyl, dinitrophenyl, naphthyl and nitronaphthyl; X represents halo or lower alkyl having 1–4 carbon atoms; and n is 3 or 4.

4,217,270

SULFO SUBSTITUTED CHROMIUM CONTAINING AZO PYRAZOLONE DYESTUFF

Hans U. Schutz, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

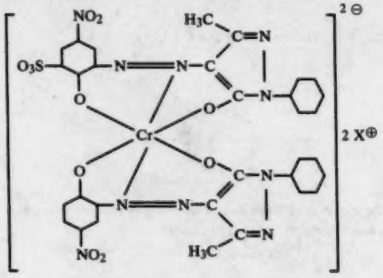
Continuation of Ser. No. 540,200, Jan. 10, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 695,706

Claims priority, application Switzerland, Jan. 30, 1974, 1262/74

Int. Cl.² C09B *45/16, 45/48;* D06P *1/10, 3/24*

U.S. Cl. 260—145 B **1 Claim**

1. The chromium complex dye of the formula



wherein X⊕ is a cation.

4,217,271

BASIC AZO DYESTUFFS CONTAINING A N-PICOLINIUM ALKYLENE AMINO PHENYL GROUP

Peter Gregory, and Edwin D. Harvey, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

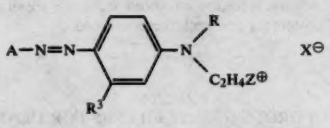
Filed Mar. 29, 1978, Ser. No. 891,384

Claims priority, application United Kingdom, May 3, 1977, 18434/77

Int. Cl.² C09B *29/36*

U.S. Cl. 260—156 **5 Claims**

1. A basic azo dyestuff devoid of sulphonic acid and carboxylic acid groups having the formula:



wherein A is an optionally substituted aromatic carbocyclic or heterocyclic radical, R is alkyl containing from 1 to 4 carbon atoms which may be branched or unbranched, Z is 3 or 4-methylpyridinium, R^3 is hydrogen or methyl and $X^{\ominus}$ is an anion.

4,217,272

NOVEL MONOAZO AND DISAZO COLORANTS FROM AMINOALKYLANILINES AND BIS(AMINOALKYL)ANILINES

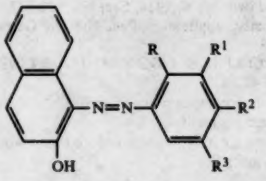
Nathan N. Crounse, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 821,792, Aug. 4, 1977, Pat. No. 4,153,598, which is a division of Ser. No. 641,566, Dec. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 548,015, Feb. 7, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 949,871

Int. Cl.² C09B *29/22*

U.S. Cl. 260—163 **9 Claims**

1. A compound of the formula



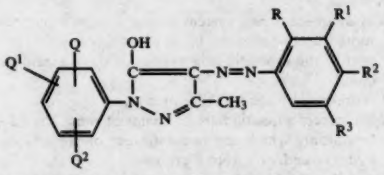
wherein:

R is hydrogen, lower-alkyl, lower-alkoxy or halogen,

R^2 is hydrogen, lower-alkyl, lower alkoxy or halogen,

R^1 and R^3 are aminomethyl; and the acid addition salts thereof.

2. A compound of the formula



wherein:

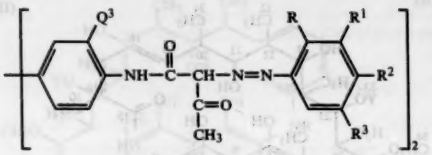
R is hydrogen, lower-alkyl, lower-alkoxy or halogen,

R^2 is hydrogen, lower-alkyl, lower-alkoxy or halogen,

R^1 and R^3 are aminomethyl;

Q, Q^1 and Q^2 are the same or different and are each hydrogen, lower-alkyl, lower-alkoxy, nitro or halogen; and the acid addition salts thereof.

3. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, lower-alkoxy or halogen;

R^2 is hydrogen, lower-alkyl, lower-alkoxy, halogen, aminomethyl or 2-aminoethyl;

R^1 and R^3 are the same or different and are each hydrogen, lower-alkyl, lower alkoxy, halogen or aminomethyl with the proviso that at least one of R^1 and R^3 is aminomethyl when R^2 is other than aminomethyl or 2-aminoethyl;

Q^3 is hydrogen, lower-alkyl, lower-alkoxy or halogen; and the acid addition salts thereof.

4,217,273

PROCESS FOR AZO PIGMENTS

Isaiah Von, New Brunswick, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,567

Int. Cl.² C09B *29/04*

U.S. Cl. 260—202 **2 Claims**

1. In a process for the preparation of an azo pigment whereby a diazo of an aromatic amino sulfonic acid is coupled into 2-hydroxy-3-naphthoic acid and whereby said pigment is optionally converted into the alkali metal, alkaline earth metal, or manganese salt thereof, the improvement which comprises: (1) forming an aqueous alkaline solution of 2-hydroxy-3-naphthoic acid, containing up to about a 20 percent molar excess over that amount stoichiometrically required to couple with said diazo com-(2) adding to said solution an amount of alkali metal hypochlorite to produce in situ 1-chloro-2-hydroxy-3-naphthoic acid, such that the amount thereof comprises from about 1 to 10 percent by weight, based on the total weight of 2-hydroxy-3-naphthoic acid and 1-chloro-2-hydroxy-3-naphthoic acid; and (3) adding thereto an aqueous solution of said diazo compound.

4,217,274

METHOXYETHOXYMETHYL ESTERS OF PENICILLINS

Julius A. Vida, Greenwich, Conn., and Kenneth A. Kerridge, Syracuse, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,451

Int. Cl.² C07D *499/32*

U.S. Cl. 260—239.1 **4 Claims**

1. An ester in which the group having the formula $—CH_2OCH_2CH_2OCH_3$ has replaced the hydrogen of the carboxyl group substituted on the bicyclic nucleus of a penicillin and said penicillin is selected from the group consisting of oxacillin, cloxacillin, dicloxacillin, flucloxacillin, hetacillin, metampicillin, heta-amoxicillin and nafcillin.

4,217,275

β-LACTAM ANTIBIOTIC ESTERIFICATION PROCESS USING METHOXYMETHYL METHANE SULFONATE

Gary M. F. Lim, Candiac, and Roberto D. Droghini, St-Leonard, both of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 16,238

Int. Cl.² C07D *499/08, 501/02*

U.S. Cl. 260—239.1 **4 Claims**

1. In the process for esterifying the 3-carboxyl group of a penicillin or the 4-carboxyl group of a cephalosporin to form a methoxymethyl ester group, the improvement of carrying out the esterification by reaction of the penicillin or cephalosporin free acid or a carboxylic acid salt thereof with methoxymethyl methanesulfonate as the esterifying agent in a substantially anhydrous inert organic solvent in the presence of base and at a temperature of from about −20° C. to about +50° C.

2. The process according to claim 1 wherein the β-lactam starting material is hetacillin or heta-amoxicillin.

4,217,276

RIFAMYCIN COMPOUNDS

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Rovereto, Italy

Filed Jan. 22, 1979, Ser. No. 5,668

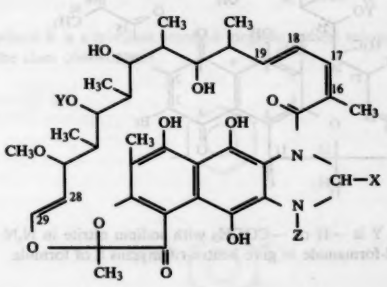
Claims priority, application United Kingdom, Feb. 7, 1978, 4773/78

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.² C07D *497/18*

U.S. Cl. 260—239.3 P **2 Claims**

1. A rifamycin compound selected from the group consisting of compounds having the formula:



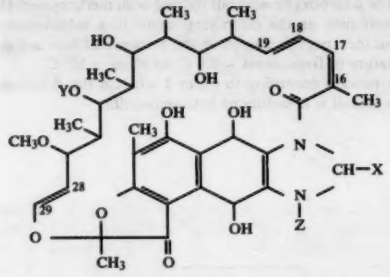
(I)

wherein:

Y is —H or $—COCH_3$,

Z is allyl, hydroxyethyl, cycloalkyl having from 3 to 6 carbon atoms, benzyl, phenyl, chlorophenyl and tetrahydrofurfuryl,

X is hydrogen, alkyl having from 1 to 5 carbon atoms, cyclohexyl, alkenyl, having from 3 to 6 carbon atoms, cycloalkenyl having 6 carbon atoms, phenyl, phenyl substituted with a methoxy group, un-substituted arylalkenyl having 8 carbon atoms, a 5 membered heterocycle having one heteroatom selected from the group consisting of O and S, substitution products for the above specified 5 membered heterocycle having substituents selected from the group consisting of halogen, methyl and mixtures thereof, a 6 membered heterocycle having one O-heteroatom; 16, 17, 18, 19 and tetrahydroderivatives thereof; 16, 17, 18, 19, 28, 29 hexahydroderivatives thereof; and corresponding oxidized products having formula



(II)

wherein X, Y and Z are as above identified.

4,217,277

PROCESS FOR PRODUCING 3-AMINO-RIFAMYCINS S AND SV

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Milan, Italy

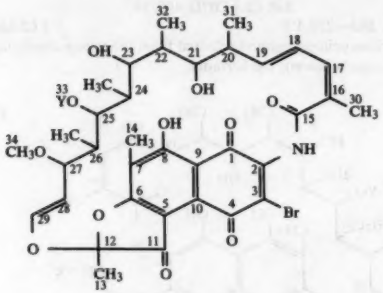
Filed Feb. 28, 1979, Ser. No. 16,006

Claims priority, application United Kingdom, Mar. 9, 1978, 929578

Int. Cl.[2] C07D *413/04*

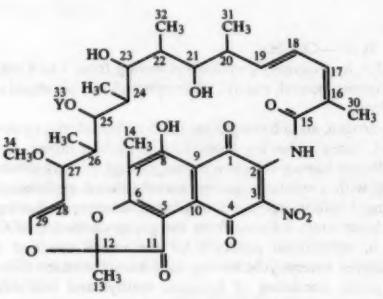
U.S. Cl. 260—239.3 P **1 Claim**

1. A process for producing 3-amino-rifamycins S and SV which comprises reacting a 3-bromo-rifamycin S of formula:



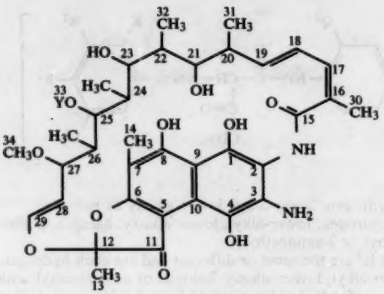
(I)

wherein Y is —H or —$COCH_3$ with sodium nitrite in N,N-dimethyl-formamide to give 3-nitro-rifamycins S of formula



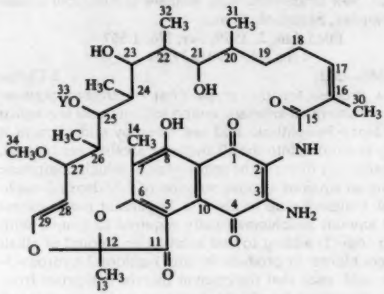
(II)

wherein Y is as above defined, and finally reducing the nitro group with a reducing agent consisting of zinc powder to give the 3-amino-rifamycin SV of formula:



(III)

which by transformation is situ of the hydroquinon to quinon form by means of an oxidating agent selected from the group consisting of manganese dioxide, aqueous potassium ferricyanide and aqueous magnesium persulfate, gives the 3-amino-rifamycin S of formula



(IV)

4,217,278

3-NITRO-RIFAMYCINS S AND SV

Vittorio Rossetti; Leonardo Marsili, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Laboratori Chimico Farmacologici S.p.A., Milan, Italy

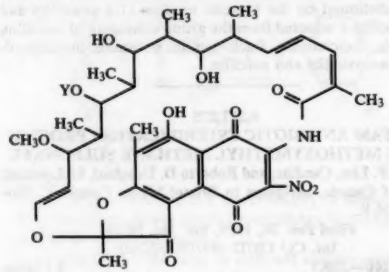
Continuation-in-part of Ser. No. 16,006, Feb. 28, 1979. This application Feb. 28, 1979, Ser. No. 16,080

Claims priority, application United Kingdom, Mar. 9, 1978, 9294/78

Int. Cl.[2] C07D *413/04*

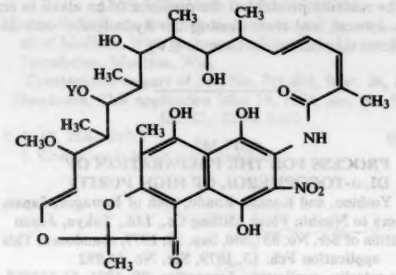
U.S. Cl. 260—239.3 P **4 Claims**

1. 3-nitro-rifamycins S of formula



(I)

and their hydroquinonic derivatives 3-nitro-rifamycin SV of formula



wherein Y is —H or —$COCH_3$.

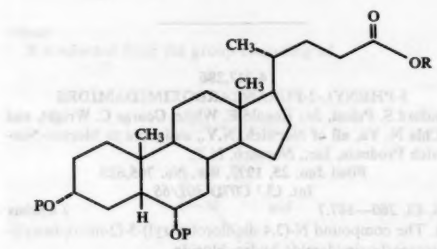
4,217,279

SYNTHESIS OF STEROIDS

Emil T. Kaiser, 5634 S. Woodlawn Ave., Chicago, Ill. 60639

Filed Dec. 18, 1978, Ser. No. 970,471
Int. Cl.² C07J *9/00, 71/00*
U.S. Cl. 260—239.55 R **26 Claims**

1. A steroid compound having the structure:



where P is alkyl, alkyl ether or 2-tetrahydropyranyl and R is alkyl.

2. A compound as set forth in claim **1** in which P is 2-tetrahydropyranyl.

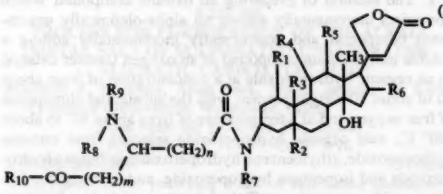
4,217,280

AMINO-3-CARDENOLIDE DERIVATIVES, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Francois-Xavier Jarreau, Versailles, and Jean-Jacques Koenig, Chilly-Mazarin, both of France, assignors to Etablissements Nativelle S.A., Paris, France

Filed Jan. 26, 1979, Ser. No. 6,710
Claims priority, application France, Jan. 27, 1978, 78 02390
Int. Cl.² C07J *19/00*; A61K *31/58*
U.S. Cl. 260—239.57 **13 Claims**

1. Cardenolide derivatives represented by the general formula I



wherein m and n, which may be the same or different, each represents an integer from 0 to 4; R_1, R_2, R_4, R_5 and R_6, which may be the same or different, each represents a hydrogen atom or a hydroxy, alkoxy or acyloxy group; R_3 represents a lower alkyl, aldehyde, haloalkyl, hydroxyalkyl, acyloxyalkyl or ethylenedioxyalkyl group; R_7 represents a hydrogen atom or an alkyl group; R_8 represents a hydrogen atom or an alkyl, acyl, alkyloxycarbonyl or aralkoxycarbonyl group; R_9 represents a hydrogen atom or an alkyl group; R_8 and R_9 can combine with the nitrogen atom and form a heterocyclic ring; R_{10} represents a hydroxy, alkoxy, or aralkoxy group, an amino acid group or an oligopeptide group bonded through the nitrogen atom of said amino acid group or of said oligopeptide group; and basic mineral and organic acid salts thereof.

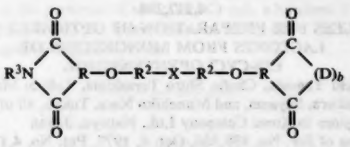
4,217,281

IMIDE CARBONYL COMPOUNDS AND METHOD FOR MAKING

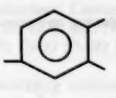
Ronald L. Markezich, and Tohru Takekoshi, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

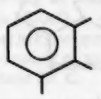
Division of Ser. No. 729,126, Oct. 4, 1976, Pat. No. 4,128,574. This application Aug. 21, 1978, Ser. No. 935,616
Int. Cl.² C07D *209/48, 307/89*
U.S. Cl. 260—326 A **5 Claims**

1. An imide carbonyl compound having the formula,

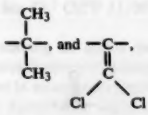


where R is a trivalent aromatic organic radical selected from the class consisting of





R^3 is a $C_{(1-20)}$ organic radical selected from the class consisting of $C_{(1-8)}$ alkyl radicals, $C_{(6-13)}$ aryl radicals, and halogenated derivatives thereof, R^2 is selected from arylene radicals and $C_{(1-8)}$ alkylene radicals and halogenated derivatives thereof, D is selected from the class consisting of —O— and —OH, X is a member of the class consisting of —O—, —S—,



and b is an integer equal to 1 or 2 and when b is 1, D is —O— and when b is 2, D is —OH.

4,217,282

PROCESS FOR MAKING N-(2-METHYL-1-NAPHTHYL)-MALEIMIDE

Wayne R. Heitmann, Gurnee, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 21, 1979, Ser. No. 13,099
Int. Cl.[2] C07D *207/44, 207/40*
U.S. Cl. 260—326.5C 7 Claims

1. The process of making N-(2-methyl-1-naphthyl)-maleimide consisting essentially in heating 2-methyl-1-napthylamine and maleic anhydride in a molar ratio between 1:1 and 1:1.2 in the presence of an inert organic solvent which has a boiling point of 80° C. or above and a catalytic amount of an acid of the formula R—$OP(OH)_2O$ or R′—OSO_2OH wherein R is H or loweralkyl and R′ is loweralkyl, R-phenyl or R-benzyl, said heating being carried out at or above the temperature where water evaporates from the liquid mixture and being continued until the distillate is essentially free of water.

4,217,283

3-AZABICYCLO(3.1.0)HEXAN-4-ONE-2-CARBONITRILE

Ronald F. Mason, Westwell, Nr. Ashford, and Barry R. J. Devlin, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 23, 1979, Ser. No. 14,528
Claims priority, application United Kingdom, Mar. 1, 1978, 8066/78
Int. Cl.[2] C07D *207/44*
U.S. Cl. 260—326.5 B 1 Claim

1. 3-azabicyclo(3.1.0)-hexan-4-one-2-carbonitrile.

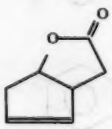
4,217,284

PROCESS FOR PREPARATION OF OPTICALLY PURE LACTONES FROM MONOESTERS OF CIS-CYCLOPENTENEDIOL

Shun-ichi Yamada, Chofu; Shiro Terashima, Tokyo; Masahiko Nagakura, Sayama, and Munehiko Nara, Tokyo, all of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

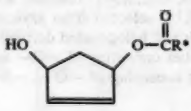
Division of Ser. No. 839,356, Oct. 4, 1977, Pat. No. 4,170,596.
This application Jun. 30, 1978, Ser. No. 920,833
Claims priority, application Japan, Oct. 5, 1976, 51-119745; Oct. 5, 1976, 51-119746; Oct. 5, 1976, 51-119747
Int. Cl.[2] C07D *307/93*
U.S. Cl. 260—343.3 P 10 Claims

1. A process for producing an optically active lactone of the following formula



(IV)

which comprises reacting a monoester of cis-cyclopentendiol of the following formula



(I)

wherein

is an optically active acyl moiety, derived from an optically active neutral amino acid, the amino group of which is protected by a sulfonyl group, with a trialkyl orthoacetate, hydrolyzing the reaction product in the presence of an alkali in an aqueous solvent, and then treating the hydrolyzate with an acid to form said lactone of formula (IV).

4,217,285

PROCESS FOR THE PREPARATION OF DL-α-TOCOPHEROL OF HIGH PURITY

Youziro Yoshino, and Kazuko Kondo, both of Kawagoe, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 837,640, Sep. 28, 1977, abandoned. This application Feb. 13, 1979, Ser. No. 11,882
Claims priority, application Japan, Sep. 29, 1976, 51-115965
Int. Cl.[2] C07D *311/72*
U.S. Cl. 260—345.5 1 Claim

1. A process for the preparation of dl-α-tocopherol of high purity, characterized by condensing trimethyl hydroquinone and a phytol in the presence of (a) silica-alumina, zinc chloride and an acid selected from the group consisting of sulfuric acid, phosphoric acid, p-toluenesulfonic acid and hydrochloric acid, or (b) silica gel, zinc chloride and an acid selected from the group consisting of sulfuric acid, phosphoric acid, p-toluenesulfonic acid and hydrochloric acid.

4,217,286

5-PHENYL-2-FURANCARBOXIMIDAMIDES

Stanford S. Pelosi, Jr.; Ronald E. White; George C. Wright, and Chia N. Yu, all of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jan. 25, 1977, Ser. No. 765,623
Int. Cl.[2] C07D *307/68*
U.S. Cl. 260—347.7 2 Claims

1. The compound N-(3,4-dichlorobenzyl)-5-(2-nitrophenyl)-2-furancarboximidamide hydrochloride.

2. The compound 5-(2-aminophenyl)-N-(3,4-dichlorobenzyl)-2-furancarboximidamide hydrochloride methanolate.

4,217,287

EPOXIDATION OF ALPHA-OLEFINS

Ching-Yong Wu, O'Hara Township, Allegheny County; Harold E. Swift, Gibsonia, and John E. Bozik, Plum Borough, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 637,267, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 187,138, Oct. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 816,817, Apr. 16, 1969, abandoned. This application Aug. 11, 1978, Ser. No. 932,906
Int. Cl.[2] C07D *301/20*
U.S. Cl. 260—348.29 18 Claims

1. The method of preparing an oxirane compound which comprises incrementally adding an alpha-olefinically unsaturated compound and concurrently incrementally adding a soluble molybdenum compound as an oxygen transfer catalyst to an organic hydroperoxide at a concentration of from about 10 to about 50 weight percent with the substantial elimination of free oxygen and at a temperature of from about 80° to about 150° C., said organic hydroperoxide selected from cumene hydroperoxide, ethylbenzene hydroperoxide, isobutane hydroperoxide and isopentane hydroperoxide, and said organic hydroperoxide containing sufficient barium oxide in admixture with the hydroperoxide to stabilize the hydroperoxide against decomposition.

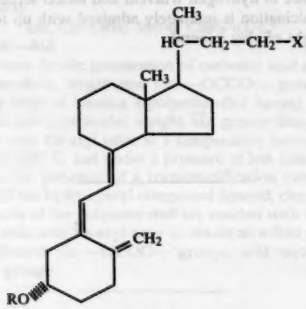
4,217,288

ANTI-VITAMIN D COMPOUNDS

Hector F. DeLuca; Heinrich K. Schnoes, and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

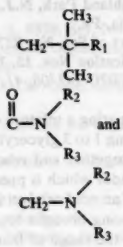
Continuation-in-part of Ser. No. 781,008, Mar. 24, 1977, abandoned. This application May 19, 1978, Ser. No. 907,893
Int. Cl.[2] C07J 9/00
U.S. Cl. 260—397.2 10 Claims

1. Compounds having the formula



where

X is selected from the group consisting of



and

R is selected from the group consisting of hydrogen, an acyl group having from 1 to about 6 carbon atoms and benzoyl, R_1 is lower alkyl and R_2 and R_3 are each hydrogen, lower alkyl, lower acyl or aryl.

2. The compound of claim 1 wherein

R is hydrogen and

where each of R_2 and R_3 are methyl.

4,217,289

PROCESS FOR PURIFICATION OF THE ALKALI METAL SALT OF SULFONATED UNSATURATED ALIPHATIC CARBOXYLIC ACID

Matthew A. Boehmer, Allen Park, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 30, 1979, Ser. No. 25,645
Int. Cl.[2] C07C 143/90; C09F 5/10
U.S. Cl. 260—400 10 Claims

1. A process for purifying a salt of sulfonated unsaturated aliphatic carboxylic acid containing fatty acid impurities which comprises the steps of

diluting the mixture of the salt of sulfonated acid and impurities with an amount of water sufficient to provide an aqueous solution containing from about 5 to 30 percent by weight of the salt of sulfonated acid,

adding an isoparaffinic hydrocarbon solvent having a boiling point in the range of from about 150° C. to about 260° C. in an amount such that the hydrocarbon is present in about 10 to about 50 percent by volume,

agitating the mixture for a time sufficient to provide an intimate contact of the solvent with the impurities,

holding the material in a quiescent state for a time sufficient to allow the water and solvent to separate into layers, and

drawing off the aqueous layer.

4,217,290

PROCESS FOR PREPARING BIFUNCTIONAL ALIPHATIC ORGANIC COMPOUNDS

Paolo Maggioni, Cernusco Montevecchio; Francesco Mauri, Milan, and Attilio Citterio, Monza, all of Italy, assignors to Brichima S.p.A., Milan, Italy

Filed Jun. 20, 1979, Ser. No. 50,331
Claims priority, application Italy, Jun. 26, 1978, 24744 A/78; Jun. 20, 1978, 24949 A/78
Int. Cl.[2] C09F 5/00; C11C 3/00, 3/02; C07C 121/00, 87/28
U.S. Cl. 260—404 7 Claims

1. A process for preparing bifunctional aliphatic organic compounds of at least 6 carbon atoms, wherein a cycloaliphatic oxyhydroperoxide is reacted with an alpha-olefine having its double bond activated by a conjugate electron-attracting group, in the presence of a bivalent Cr salt, a bivalent V salt or a trivalent Ti salt, at a temperature of 20° to 80° C. in water or in an aqueous organic solvent.

4,217,291

METHOD OF OXIDIZING OSMIUM (III) AND OSMIUM (IV) TO A HIGHER VALENCY STATE

Ching-Yong Wu, O'Hara Township, Allegheny County, and Thaddeus P. Kobylinski, Gibsonia, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 972,929
Int. Cl.[2] C07F 15/00; C01G 55/00; B01J 23/96, 31/18
U.S. Cl. 260—429 R 12 Claims

1. The method for oxidizing osmium in an ionic complex from a valency state less than 5 to a valency state greater than 5 which comprises contacting an ionic complex of osmium having the general formula M_xOsO_y in which M is alkali metal, ammonium, or tetra(lower)alkylammonium and 2y-x is less than 5 with an organic secondary or tertiary hydroperoxide at a temperature less than about 30° C.

4,217,292

PROCESS FOR MAKING AMINE MOLYBDATES

William J. Kroenke, Brecksville, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 1, 1979, Ser. No. 16,583
Int. Cl.[2] C07F 11/00
U.S. Cl. 260—429 R 12 Claims

1. A process for making an amine molybdate comprising reacting essentially stoichiometric quantities of molybdenum trioxide with an amine in an aqueous medium essentially free of acid and in which is dissolved a water-soluble ammonium or monovalent metal or divalent metal or trivalent rare earth metal salt of an acid or a combination of one or more of said water-soluble salts.

4,217,293

STABILIZED MANEB AND PREPARATION THEREOF

John B. Adams, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 935,507, Aug. 21, 1978, abandoned. This application Apr. 2, 1979, Ser. No. 26,201

Int. Cl.[2] C07F *13/00*

U.S. Cl. 260—429 K 10 Claims

1. A process for preparing a stabilized maneb of low ethylenethiourea content which comprises the steps of mixing nabam with formaldehyde in aqueous medium and then mixing the formaldehyde-treated nabam with a water-soluble manganese(II) salt to precipitate the maneb.

7. A stabilized maneb of low ethylenethiourea content prepared by the process which comprises mixing nabam with formaldehyde in aqueous medium then mixing the formaldehyde-treated nabam with a water-soluble manganese(II) salt to precipitate the maneb.

4,217,294

METHOD FOR PRODUCING MERCAPTAN-CONTAINING ORGANOSILICON COMPOUNDS

Herbert E. Petty, Bethel, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,658

Int. Cl.[2] C07F *7/10, 7/18*

U.S. Cl. 556—419 8 Claims

1. A process for preparing gamma-mercaptopropyltrialkoxysilane which comprises

reacting beta-cyanoethyltrialkoxysilane with about one mole of hydrogen sulfide in the presence of an amine catalyst at a temperature not exceeding 100° C. to form a beta-(thiocarboxamido) ethyltrialkoxysilane intermediate and subsequently

reacting the beta-(thiocarboxamido) ethyltrialkoxysilane with hydrogen under pressure, at a temperature between about 100° C. and about 300° C., in the ratio of at least two moles of hydrogen for each mole of the silane, and in the presence of about 0.01 to about 10 weight percent, based on the weight of the silane and hydrogen, of a transition metal polysulfide catalyst to form a gamma-mercaptopropyltrialkoxysilane.

4,217,295

PROCESS OF CATALYTIC METHANATION

Heinz G. Friedrich, Houston, Tex., and James V. Kennedy, Westfield, N.J., assignors to NL Industries, Inc., New York, N.Y.

Continuation of Ser. No. 596,518, Jul. 16, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,534

Int. Cl.[2] C01C *1/04*

U.S. Cl. 260—449.6 M 17 Claims

1. In a process wherein a carbon oxide is catalytically hydrogenated so as to form methane by passing said carbon oxide together with hydrogen over a heated catalyst, the improvement which comprises utilizing as said catalyst an amorphous nickel silicate resulting from the calcination and reduction of a nickel serpentine having a chemical composition represented by the following:

$$(Ni_jR_gM_{6-j-g})(R_hSi_{4-h})O_{10}(OH,F)_8;$$

wherein:

M is Mg, Co++, Fe++, Cu++, Mn++, Zn++, or mixtures thereof;

R is Al, Cr+++, or mixtures thereof;

$Zn \leq 4$, $Cu \leq 0.5$, $Mn \leq 0.5$,

$g+h=2X$

$O \leq x < 0.1$; $0.5 \leq y \leq 6$;

and

wherein the first parenthesis shows the cations in the octahedral layer and the second parenthesis shows the cations in the tetrahedral layer; and wherein from zero to two fluoride ions may be present for a total of eight hydroxide plus fluoride; this precursor nickel serpentine prior to calcining being a 1:1 trioctahedral phyllosilicate in general having a substantially balanced framework, from the standpoint of total charge, with no exchangeable ions needed for neutrality, said calcination and reduction being carried out at a temperature of about 500° C. to about 900° C. and for a time sufficient to destroy the crystallinity of the precursor nickel serpentine and produce said amorphous nickel silicate, said reduction being performed in the presence of hydrogen wherein said nickel serpentine prior to said calcination is intimately admixed with up to about its own weight of clay mineral.

4,217,296

ALKYL GLYCERYL ETHER SULFATE SALTS AND PROCESS FOR THEIR PREPARATION

Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 927,183, Jul. 24, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 960,342

Int. Cl.[2] C07C *141/08, 41/02, 43/11*

U.S. Cl. 260—458 R 23 Claims

1. A process for preparing a mixture of linear alkyl glyceryl ether alcohols containing 1 to 3 glyceryl units which comprises the steps of bringing together and reacting, a C_{10}–C_{20} linear alkyl alcohol and glycidol which is predissolved in hexyl acetate, in the presence of an acid catalyst in a reaction zone, said alcohol and glycidol being brought together and reacted in a molecular ratio within the range of from about 1.5:1 to about 8:1; maintaining the resulting reaction mass in an agitated condition; maintaining the temperature of the reaction mass within the range of from about 25° to about 125° C. during the reaction period; and recovering said mixture of linear alkyl glyceryl ether alcohols from the reaction mass.

8. A process for preparing a mixture of linear alkyl glyceryl ether sulfate salts containing 1 to 3 glyceryl units which comprises the steps of bringing together and reacting, a C_{10}–C_{20} linear alkyl alcohol and glycidol wich is predissolved in hexyl acetate, in the presence of an acid catalyst in a reaction zone, said alcohol and glycidol being brought together and reacted in a molecular ratio within the range of from about 1.5:1 to about 8:1; maintaining the resulting reaction mass in an agitated condition; maintaining the temperature of the reaction mass within the range of from about 25° to about 125° C. during the reaction period, recovering a mixture of linear alkyl glyceryl ether alcohols containing 1 to 3 glyceryl units from the reaction mass, contacting and reacting said mixture of ether alcohols with a sulfating agent, said ether alcohols and sulfating agent being contacted and reacted in a molecular ratio within the range of from about 1:1 to about 1:1.15; maintaining the resulting sulfation reaction mass in an agitated condition; maintaining the temperature of the sulfation reaction mass within the range of from about −15° to about 75° C. during the reaction period; recovering a mixture of linear alkyl glyceryl ether sulfates, neutralizing said mixture of sulfates with base and recovering a mixture of linear alkyl glyceryl ether sulfate salts containing 1 to 3 glyceryl units.

4,217,297

PROCESS FOR THE PREPARATION OF CARBONIC ACID ARYL ESTERS OF POLYESTER-DIOLS LENGTHENED VIA CARBONATE GROUPS

Christian Lindner, Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal; Manfred Schreckenberg; Dieter Freitag, both of Krefeld, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,212

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712435

Int. Cl.[2] C07C *68/06*; C08G *63/62*

U.S. Cl. 260—463 15 Claims

1. A process for the preparation of carbonic acid aryl esters of polyester-diols, lengthened via —OCOO— groups, comprising the steps of heating a polyester-diol having alcoholic end groups and a molecular weight $\overline{M}n$ greater than 250 with a carbonic acid bis-aryl ester at a temperature between about 100° C. and 200° C. and under a pressure of less than about 35 mm Hg in the presence of a transesterification catalyst, and distilling off the hydroxyaryl compound formed, characterized in that n mols of the polyester-diol are reacted with n+1 mols of the carbonic acid bis-aryl ester to obtain an n-fold polyester-diol, lengthened via —OCOO— groups, with terminal aryl carbonate groups.

4,217,298

PROCESS FOR PREPARING ORGANIC CARBONATES

Kazuo Shikata, Tokuyama, and Toshiaki Shigemune, Hohfu, both of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Filed Sep. 1, 1978, Ser. No. 938,921

Claims priority, application Japan, Sep. 5, 1977, 52-105897; Dec. 21, 1977, 52-152836

Int. Cl.[2] C07C *68/04*

U.S. Cl. 260—463 12 Claims

1. A process for producing an organic carbonate, which comprises reacting:

A. an alkali metal carbonate or bicarbonate;

B. carbon dioxide gas;

C. an alcohol having an alcoholic hydroxyl group selected from the group consisting of

(i) an alcohol of the following formula

$$R—OH$$

wherein R represents a moiety selected from the group consisting of C_1–C_{12} saturated alkyl or C_2–C_{12} alkenyl groups, said groups being substituted by at least one member selected from the group consisting of hydroxy and alkoxy of 1 to 10 carbon atoms, and C_7–C_{11} aralkyl groups substituted by at least one member selected from the group consisting of a hydroxy and alkoxy with 1 to 4 carbon atoms;

(ii) a polyalkylene glycol having an average molecular weight of about 100 to 1,000; and

(iii) diethylene glycol ethylether, and

D. an organic halide of the formula

wherein R^2, R^3 and R^4, independently from each other, represent a moiety selected from the group consisting of a hydrogen atom; C_1–C_{11} saturated alkyl groups or C_2–C_{12} alkenyl groups unsubstituted or substituted by at least one member selected from the group consisting of alkoxy groups with 1 to 4 carbon atoms and halogen atoms; a phenyl group unsubstituted or substituted by at least one member selected from the group consisting of alkyl groups with 1 to 4 carbon atoms, a vinyl group, a phenyl group, alkoxy groups with 1 to 4 carbon atoms, and halogen atoms; and C_7–C_{11} aralkyl groups unsubstituted or substituted by at least one member selected from the group consisting of a hydrogen atom, alkoxy groups with 1 to 4 carbon atoms and halogen atoms; and X represents a halogen atom,

in the presence of a catalyst selected from the group consisting of tertiary amines, quaternary ammonium salts, phosphines and quaternary phosphorous salts,

and the reaction is performed in an atmosphere of carbon dioxide gas.

4,217,299

METHOD FOR CONVERTING UNSATURATED COMPOUND HAVING FUNCTIONAL GROUP

Ryuichi Nakamura, Tokyo; Seiji Fukuhara, Yokkaichi; Shuichi Matsumoto, Yokohama, and Koei Komatsu, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Division of Ser. No. 527,433, Nov. 26, 1974, Pat. No. 3,974,196. This application Feb. 17, 1976, Ser. No. 658,749

Claims priority, application Japan, Nov. 28, 1973, 48/134171; Jul. 29, 1974, 49/85987

Int. Cl.[2] C07C *121/30, 121/48, 121/70, 120/00*

U.S. Cl. 260—464 8 Claims

1. A method for disproportionating an ethylenically unsaturated compound or a mixture of ethylenically unsaturated compounds, which comprises:

reacting at a temperature of from −30° C. to +300° C. a compound (1) having the formula:

$$R^1R^2C=CR^3X \quad (1)$$

wherein R^1 is hydrogen, $C_{1\text{-}15}$ alkyl, alkenyl or X; R^2 and R^3 are independently hydrogen or $C_{1\text{-}3}$ alkyl, and X is a group having the formula:

$$+CR^4{}_{2}{}_{a}Y (a \geqq 1)$$

wherein Y is CN and R^4 represents hydrogen or $C_{1\text{-}15}$ alkyl and all of the R^4 groups are not required to be the same, with the proviso that when R^1 is alkenyl, the double bond of the group is not in a position which is conjugate to the double bond in formula (1),

or a mixture of said compound (1) and a compound (2) selected from the group consisting of 1,4-polybutadiene; 1,2-polybutadiene; a compound having the formula,

$$R^{14}R^{15}C=CR^{16}R^{17}$$

wherein R^{14} and R^{16} are hydrogen or $C_{1\text{-}3}$ alkyl and R^{15} and R^{17} represent hydrogen, $C_{1\text{-}15}$ alkyl, aralkyl, aryl, or halohydrocarbon groups, with the proviso that when R^{15} and R^{17} are halohydrocarbon groups, no sites of carbon-carbon unsaturation exist at a position conjugate to the double bond; and a cyclic compound having the formula:

wherein —Z— represents $+CH_2{}_{b}$ or $+CH_2{}_{c}CH=CH—CH_2{}_{d}$ (b≧1, c≧1, d≧1), the cyclic compound being present in an excess amount sufficient to prevent polymer formation,

with a catalyst consisting essentially of a combination of at least one member selected from the group consisting of the halides, oxyhalides, carbonyl complexes, alkoxides, oxyalkoxides and alkoxyhalides of tungsten, molybdenum or rhenium with $(CH_3)_{1.5}AlCl_{1.5}$, wherein the atomic

ratio of Me:Al in the catalyst, wherein Me is W, Mo or Re, is within the range from 1/1 to 1/15.

4,217,300

PREPARATION OF DIHALOGENOVINYLCYCLOPROPANECARBOXYLIC ACIDS AND ESTERS

Reinhard Lantzsch, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

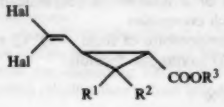
Filed Feb. 21, 1978, Ser. No. 879,424

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710174

Int. Cl.[2] C07C *69/74*

U.S. Cl. 260—465 D **13 Claims**

1. A process for the preparation of a dihalogenovinylcyclopropanecarboxylic acid or an ester thereof, of the general formula



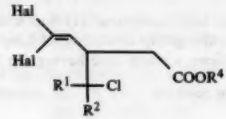
in which

Hal each independently is fluorine, chlorine, or bromine,

R^1 and R^2 each independently is hydrogen or C_{1-4}-alkyl, or R^1 and R^2 together with the adjacent carbon atom form a cycloaliphatic ring with up to 7 carbon atoms, and

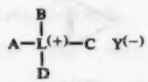
R^3 is hydrogen, C_{1-4}-alkyl or arylmethyl or heteroarylmethyl,

which comprises reacting a 3-chloro-2-(2',2'-dihalovinyl)-butane carboxylic acid ester of the formula



in which

R^4 is C_{1-4}-alkyl or arylmethyl or hetero-arylmethyl, with a base in aqueous solution in the presence of an inert solvent selected from the group consisting of a hydrocarbon, chlorohydro-carbon or ether, and in the presence of a catalyst of the formula



in which

L is nitrogen or phosphorus,

A, B, C, and D each independently is alkyl, aralkyl or aryl, or two of A, B, C and D together with the central atom L and optionally at least one further hetero-atom form a heterocyclic ring, and

$Y^{(-)}$ is a halide, bisulphate or hydroxyl ion.

4,217,301

CYANO-SUBSTITUTED STILBENE COMPOUNDS

Adolf E. Siegrist, Basel, and Vincenzo Coviello, Marly, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

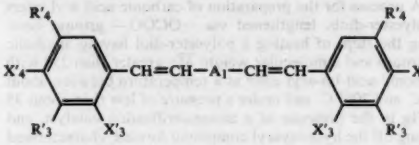
Division of Ser. No. 723,691, Sep. 16, 1976, Pat. No. 4,097,515, which is a division of Ser. No. 519,164, Oct. 30, 1974, Pat. No. 4,008,224. This application Mar. 16, 1978, Ser. No. 887,108

Claims priority, application Switzerland, Nov. 19, 1973, 16246/73; Nov. 19, 1973, 16247/73

Int. Cl.[2] C07C *121/60*

U.S. Cl. 260—465 G **3 Claims**

1. Cyano-substituted stilbene compounds of the formula



wherein A_1 represents 1,4-, 1,5- or 2,6-naphthylene, 1,4-phenylene or 4,4'- bis-phenylene, one of the symbols X'_3 and X'_4 represents the cyano radical and the other represents hydrogen or chlorine, and each of R'_3 and R'_4 independently represents hydrogen or chlorine, and at least one, and at most two, of the symbols X'_3, X'_4, R'_3 and R'_4 represents chlorine.

4,217,302

PHENOXYBENZYL 2-INDENYL-3-METHYLBUTANOATES

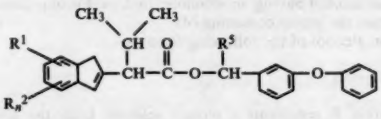
Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 927,315, Jul. 24, 1978. This application Apr. 13, 1979, Ser. No. 29,950

Int. Cl.[2] C07C *69/76, 121/66*

U.S. Cl. 260—465 D **1 Claim**

1. A compound of the following formula:



wherein,

each of R^1 and R^2 is independently selected from hydrogen, chloro, fluoro, bromo, lower alkyl, lower alkoxy and lower haloalkyl;

n is zero, one, two or three; and

R^5 is hydrogen, cyano, methyl or ethynyl.

4,217,303

PREPARATION OF UNSATURATED NITRILES

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1979, Ser. No. 32,975

Int. Cl.[2] C07C *120/00, 121/46, 121/20, 121/66*

U.S. Cl. 260—465.8 R **60 Claims**

1. In a process which comprises contacting at least one olefinic hydrocarbon reactant, at least one olefinically unsaturated mononitrile reactant, and at least one monoadduct reaction product of an olefinic hydrocarbon compound and an olefinically unsaturated mononitrile compound, in a plurality of tank reactors in series, in the presence of a diluent, under reaction conditions suitable to produce at least one olefinically unsaturated dinitrile product, each of said olefinically unsaturated mononitrile reactant and said olefinically unsaturated mononitrile compound containing at least one hydrogen atom

attached to a doubly bonded carbon atom and containing a cyano group attached to a carbon atom adjacent and doubly bonded to a carbon atom which is attached to at least one hydrogen atom, each of said olefinic hydrocarbon reactant and said olefinic hydrocarbon compound having at least one olefinic linkage having joined to one of the doubly bonded carbons a carbon atom having at least one hydrogen atom attached thereto, wherein at substantially any point in said plurality of tank reactors in series the concentration of the monoadduct reaction product in the resulting reaction mixture is within the range of about 10 to about 90 weight percent of the total reaction mixture, and wherein any unreacted reactants and the reaction products flow sequentially through said plurality of tank reactors in series;

a method for reducing the production of undesired heavy byproducts comprising the step of introducing a portion of said at least one olefinically unsaturated mononitrile compound directly into at least one of said plurality of tank reactors in series other than the initial tank reactor in the series of tank reactors.

4,217,304

CONTINUOUS REDUCTION PROCESS

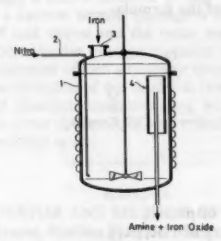
Bernhard Albrecht, Buus; Hans Frey, Bettingen; Vinzenz Habermacher, Basel; Paul Havalda, Arlesheim, all of Switzerland, and Georg Halfter, Wyhlen, Fed. Rep. of Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 20, 1978, Ser. No. 971,276

Claims priority, application Switzerland, Dec. 23, 1977, 15960/77

Int. Cl.[2] C07C *85/11, 143/58, 143/60, 143/62*

U.S. Cl. 260—508 **18 Claims**



1. A process for the reduction of aromatic nitro compounds to amino compounds in the liquid phase using iron as reducing agent, which comprises carrying out the reduction continuously such that the reducing iron, based on the amount of nitro compound present in the reactor, is present in an amount substantially in excess of the stoichiometric amount, and effecting the continuous removal of the reaction products such that the substantial excess of reducing iron is also constantly present in the reactor during the reduction.

4,217,305

PHENYLETHANOLAMINE DERIVATIVES

Kazuo Imai, Omiya; Kunihiro Niigata, Ageo; Takashi Fujikura, Hachioji; Shinichi Hashimoto, Matsudo, and Toichi Takenaka, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

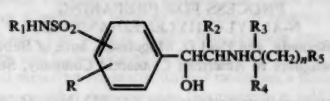
Filed Sep. 27, 1978, Ser. No. 946,192

Claims priority, application Japan, Oct. 12, 1977, 52-122034; Oct. 26, 1977, 52-128436; Dec. 23, 1977, 52-155352; Jun. 21, 1978, 53-74964

Int. Cl.[2] C07C *143/78;* **A61K** *31/18, 31/335;* **C07D** *319/18*

U.S. Cl. 260—556 AR **9 Claims**

1. Phenylethanolamine derivatives represented by the formula:



wherein R represents a member selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group, a lower alkylthio group, and a lower alkylsulfonyl group,; R_1, R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom or a lower alkyl group; R_5 represents an unsubstituted or substituted aryl group, benzodioxane ring group, aryloxy group, or arylthio group; said R_5 being, however, an unsubstituted or substituted benxodioxane ring group, aryloxy group, or arylthio group when R is a hydroxyl group; both of said R_3 and R_4 being, however, a hydrogen atom when R is a halogen atom; and n represents O or an integer of 1–3; and the acid addition salts thereof.

4,217,306

α-ARYL-α,α-BIS[ω-(DISUBSTITUTED AMINO)ALKYL]-ACETAMIDES

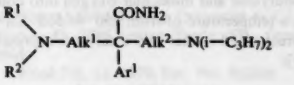
Peter K. Yonan, Morton Grove, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation-in-part of Ser. No. 901,949, May 1, 1978, Pat. No. 4,153,797, which is a division of Ser. No. 776,563, Mar. 11, 1977, Pat. No. 4,107,205. This application Sep. 8, 1978, Ser. No. 940,527

Int. Cl.[2] C07C *103/20, 103/19;* **A61K** *31/16, 31/165*

U.S. Cl. 260—557 R **12 Claims**

1. A compound of the formula



and the non-toxic pharmacologically acceptable acid addition salts thereof; wherein R^1 is lower alkyl having from 1 to 7 carbon atoms or cycloalkyl having 5 or 6 carbon atoms; R^2 is lower alkyl having from 1 to 7 carbon atoms; Ar^1 is biphenylyl, 1-or 2-naphthyl optionally substituted with halogen or lower alkyl having from 1 to 4 carbon atoms, or cycloalkyl having from 3 to 6 carbon atoms optionally substituted with lower alkyl having from 1 to 4 carbon atoms, or cyclohexyl and Alk^1 and Alk^2 are independently alkylene radicals having from 2 to 4 carbon atoms.

4,217,307

PROCESS FOR THE PREPARATION OF 2,2'-DICHLORO-HYDRAZOBENZENE

Siegfried Planker, Königstein; Konrad Baessler, and Otto Fuchs, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 25, 1978, Ser. No. 927,856

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733747

Int. Cl.[2] C07C *109/04*

U.S. Cl. 260—569 **20 Claims**

1. In a process for the preparation of 2,2'-dichlorohydrazobenzene by catalytic hydrogenation of o-nitrochlorobenzene in aqueous alkali metal hydroxide solution with addition of an aromatic non-watermiscible solvent at an elevated temperature and under pressure with a rare-metal catalyst and a polycyclic quinone co-catalyst the improvement comprising an anthraquinone as the co-catalyst.

4,217,308

PROCESS FOR PREPARING N-ALKYLETHYLENEDIAMINES

Karel F. Bernady, and Paul D. Mogolesko, both of Belle Mead, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 960,972, Nov. 15, 1978, abandoned, which is a continuation-in-part of Ser. No. 873,450, Jan. 30, 1978, abandoned. This application Jun. 14, 1979, Ser. No. 48,337

Int. Cl.[2] C07C *85/04, 85/26*

U.S. Cl. 260—583 P 25 Claims

1. A process for preparing N-alkylethylenediamine wherein the alkyl is from C_2 to about C_6 by the alkylation reaction of ethylenediamine (EDA), the improvement comprising: adding a hydrocarbon solvent to the alkylation reaction mixture; and removing, by azeotropic distillation, the unreacted ethylenediamine (EDA) remaining from the alkylation reaction.

4,217,309

PROCESS FOR PRODUCING METHACROLEIN

Sumio Umemura; Kyoji Ohdan; Kenichi Suzuki; Yasuo Bando, and Terumi Hisayuki, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Feb. 28, 1979, Ser. No. 15,903

Claims priority, application Japan, Jun. 12, 1978, 53-69832; Oct. 25, 1978, 53-130475

Int. Cl.[2] C07C *45/04*

U.S. Cl. 568—477 10 Claims

1. A process for producing methacrolein by the catalytic oxidation of isobutylene, comprising bringing a feed gas containing isobutylene and molecular oxygen into contact with a catalyst at a temperature of from 250° to 500° C., which process is characterized in that said catalyst is represented by the formula (1):

$$Mo_aCo_bFe_cBi_dCs_eX_fY_gO_h \quad (1)$$

wherein Mo represents a molybdenum atom, Co represents a cobalt atom, Fe represents an iron atom, Bi represents a bismuth atom, Cs represents a cesium atom, X represents at least one member selected from the group consisting of vanadium and palladium atoms, Y represents at least one member selected from the group consisting of titanium, nickel, tin and zirconium atoms, O represents an oxygen atom, the subscripts a through g respectively represent a positive number proportional to the number of respective metal atoms, wherein when a=12, b through g fall respectively within the following ranges: b=2 to 12, C=0.5 to 7, d=0.1 to 5, e=0.005 to 0.5, f=0.01 to 2 and g=0 to 5, and the subscript h represents a positive number proportional to the number of oxygen atoms satisfying the average valency of respective metal atoms.

4,217,310

STABILIZATION OF CYCLOHEXENE OXIDE

Charles L. Cormany, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 18, 1978, Ser. No. 934,774

Int. Cl.[2] C07C *17/40*

U.S. Cl. 260—652.5 R 6 Claims

1. Cylclohexene oxide stabilized against peroxidative autodecomposition by inclusion therein of at least about 1.5 percent by weight glycidol.

4,217,311

METHOD OF PREPARING VINYL CHLORIDE

Oleg A. Zaidman, ulitsa Moldagulovoi, 28, korpus 4, kv. 129; Erik V. Sonin, ulitsa Planernaya, 12, korpus 3, kv. 143; Ljudmila B. Sevostianova, ulitsa Gorkogo, 44, kv. 17; Alla N. Melnik, ulitsa Metallurgov, 7/18, kv. 37; Jury A. Treger, ulitsa Bolshaya Cherkizovskaya, 12, korpus 1, kv. 81; Larisa E. Paschenko, ulitsa Sormovskaya, 10, korpus 1, kv. 132; Leonid A. Oshin, ulitsa Textilschikov, 3, kv. 107, and Oleg V. Polozov, Sumskoi proezd, 2, korpus 1, kv. 323, all of Moscow, U.S.S.R.

Filed Dec. 1, 1978, Ser. No. 965,624

Int. Cl.[2] C07C *17/02*

U.S. Cl. 260—656 R 5 Claims

1. A method of preparing vinyl chloride comprising thermal chlorination of a gaseous mixture containing 5 to 50 vol.% of ethane and 50 to 95 vol.% of ethylene, by means of gaseous chlorine supplied into the reaction zone in an amount defined by the formula: amount of chlorine moles=3m+0.3n, wherein m is the number of moles of ethane, n is the number of moles of ethylene, said gaseous chlorine being supplied at 4–6 points of said reaction zone evenly distributed along the length thereof.

4,217,312

1-ALKYL-2,2-DICHLORO-2(PHOSPHINYL)ACETATES

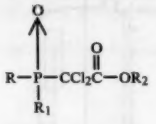
Richard F. Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 914,757, Jun. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,213, Aug. 26, 1977, abandoned. This application Aug. 1, 1978, Ser. No. 930,600

Int. Cl.[2] A01N *9/36;* C07F *9/32*

U.S. Cl. 260—941 9 Claims

1. A compound of the formula:



wherein

R is C_1–C_4 alkyl or phenyl;

R_1 is C_1–C_4 alkoxy or $NR_{11}R_{12}$;

R_2 is alkyl of 1–6 carbons, alkenyl of 3–4 carbons, cycloalkyl of 5–6 carbons or said cycloalkyl substituted with one methyl; and

R_{11} and R_{12} are independently H or C_1–C_4 alkyl.

4,217,313

DEVICE FOR REDUCING NOXIOUS EMISSIONS FROM CARBURETOR INTERNAL COMBUSTION ENGINES

Anatoly V. Dmitrievsky, B. Cherkizovskaya ulitsa, 14, korpus 1, kv. 130; Vladimir F. Kamenev, Altufievskoe shosse, 18-v, kv. 121, both of Moscow; Jury M. Pashin, ulitsa Banykina 6, kv. 63, Tolyatti Kuibyshevskoi oblasti; Nikolai M. Prudov; Alexandr I. Simatov, both of prospekt Lenina, 40-a, kv. 28, both of Dimitrovgrad Ulyanovskoi oblasti; Andrei S. Tjufyakov, ulitsa Chugunnve vorota, 21, korpus 1, kv. 46., Moscow; Jury N. Shishkin, prospekt Lenina, 194; kv. 38, and Jury I. Yamolov, Moskovsky proezd, 1/81, kv. 69, both of Tolyatti Kuibyshevskoi oblasti, all of U.S.S.R.

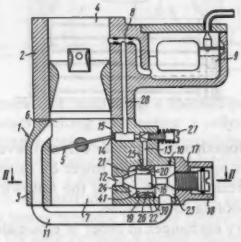
Filed Apr. 21, 1978, Ser. No. 898,917

Int. Cl.[2] F02M *3/04*

U.S. Cl. 261—41 D 6 Claims

1. A device for reducing noxious emissions from carburetor internal combustion engines, comprising: a body; at least one main passage provided in said body for feeding a fuel-air mixture to the engine cylinders; a throttle valve installed in said main passage so as to divide it into an upstream throttle space

and a downstream throttle space, as viewed in the direction of the fuel-air mixtue flow; an emulsion passage provided in said body and communicating with said upstream throttle space substantially in the area where the throttle valve upper edge locates when the throttle valve is in the closed position; an adjustable throttling element fitted in said body and adapted to close said emulsion passage; a chamber provided in said body defined by a cylindrical inner surface, which chamber connects with said emulsion passage downstream of the adjustable throttling element, as viewed in the direction of the emulsion flow, and communicates with said upstream throttle space and said downstream throttle space; a first air passage located in said body fluidly interconnecting said chamber to said upstream throttle space, said first air passage opening into said chamber



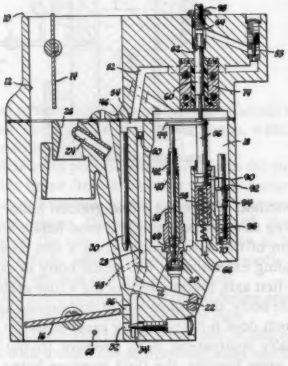
substantially tangentially to the inner surface thereof; a second passage provided in said body fluidly interconnecting said chamber to said downstream throttle space; a movable element installed in said chamber and adapted to move coaxially with said second passage for the purpose of closing same; a means for shifting said movable element axially with respect to said second passage; a sleeve installed in said chamber in such a manner that a narrow annular passage is formed between the inner wall of said sleeve and the outer wall of said movable element, which annular passage connects with said emulsion passage downstream of said adjustable throttling element with respect to the direction of the emulsion flow and separates the space of said chamber communicating with the downstream throttle space from the space of said chamber communicating with said upstream space.

4,217,314

CARBURETOR AND METHOD OF OPERATION

Dennis R. Dysarz, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1978, Ser. No. 919,257
Int. Cl.² F02M 7/24
U.S. Cl. 261—50 R **9 Claims**



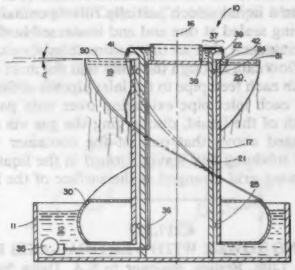
1. A carburetor comprising an induction passage, a throttle in said induction passage, a fuel passage, a metering apparatus reciprocable between a lean position and a rich position and including a metering element effective to restrict fuel flow through said fuel passage in said lean position and to permit increased fuel flow through said fuel passage in said rich position, said metering apparatus further including a force producing piston member responsive to the pressure in said induction passage downstream of said throttle for biasing said metering apparatus toward said lean position, and a force producing spring member having a bias opposing the bias of said piston member and effective to move said metering apparatus to said rich position when said pressure is above a predetermined level, and wherein said carburetor also comprises a solenoid coil and said metering apparatus also includes a solenoid armature which upon energization of said coil has a bias supplementing the bias of one of said force producing members and opposing the bias of the other force producing member, whereby said metering apparatus is disposed in a position determined by energization of said solenoid coil when said pressure is below a certain level and in said rich position when said pressure is above said certain level.

4,217,315

HUMIDIFIER AND MOVING INDOOR SCULPTURE

Miner S. Keeler, II, 2525 Indian Trails, SE., Grand Rapids, Mich. 49506

Filed Jul. 12, 1979, Ser. No. 56,860
Int. Cl.² B01F 3/04
U.S. Cl. 261—120 **10 Claims**



1. A combination humidifier and moving indoor sculpture comprising:

a reservoir for containing a body of water;

an upright helix, said helix being rotatable about its longitudinal axis;

means for floating said helix on the surface of said body of water; and

means for pumping water to the top of said helix whereupon water flows down said helix under the influence of gravity adding humidity to the surrounding atmosphere and rotatably driving said helix due to change of momentum of water flowing down said helix.

4,217,316
IMMERSED SAFETY DEVICE AND METHOD FOR PROTECTION AGAINST BACK-FIRE IN EXPLOSIVE GAS STEAMS

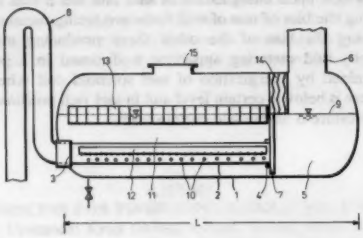
Rolf Germerdonk, Bergisch-Gladbach; Adam Jonas, Leichlingen; Claus Gockel, Odenthal-Glöbusch; Werner Hüning, Odenthal-Hahnenberg, and Götz-Gerald Börger, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1978, Ser. No. 900,687

Claims priority, application Fed. Rep. of Germany, May 14, 1977, 2721871

Int. Cl.² B01F *3/04*

U.S. Cl. 261—123 **14 Claims**



1. An apparatus for the protection of a pipe, containing an inflammable gas, against backfire comprising a container partially filled with liquid extending along a given length of the container and at a given level; at least one gas feed pipe; at least one horizontal inlet pipe, each immersed in the liquid and sealed at one end and receptive of gas at the other end from the feed pipe, wherein each inlet pipe has holes in its circumferential surface for the introduction of the gas into the liquid, and wherein each inlet pipe extends over only part of the length of the liquid in the container; a gas outlet nozzle positioned above that part of the container where there is no pipe; and a calming grid disposed at the liquid level to subdue waves in the liquid with a portion disposed below the liquid level and a portion disposed above the liquid level.

14. A method for the protection of a pipe, containing an inflammable gas, against backfire comprising: introducing the gas through holes in the circumferential surface of at least one inlet pipe into a liqiud which partially fills its container, each inlet pipe being sealed at one end and immersed in the liquid, the holes being such that at the maximum gas volume flow rate, the outflow rate through the holes is at the most 40 m/sec and the rate in each feed pipe to the inlet pipes is at the most 20 m/sec, with each inlet pipe extenging over only part of the overall length of the liquid, discharging the gas via an outlet nozzle arranged above that part of the container which is pipeless, and subduing any waves formed in the liquid during use by a calming grid arranged at the surface of the liquid.

4,217,317
COOLING TOWER WITH VERTICAL-AXIS FAN

Francis Neu, Lille, France, assignor to S.A. Delta Neu, Lille, France

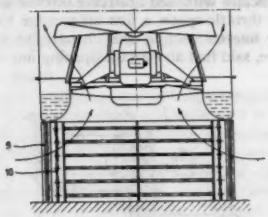
Filed Jul. 25, 1978, Ser. No. 927,939

Claims priority, application France, Mar. 13, 1978, 78 08417

Int. Cl.² B01F *3/04*

U.S. Cl. 261—160 **3 Claims**

1. A cooling tower comprising a heat-exchanging water-streaming device and a catch basin for collecting the cooled water, and located at the lower portion of the tower, said basin comprising at least one central aperture in which is mounted a fan assembly comprising a vertical-axis fan adapted to draw air from underneath the catch basin, and overhead means adapted to receive the cooled water and to distribute it to said basin via special channels formed in said means so as to discharge the cooled water in restricted areas thereby avoiding formation of water sheets, and driving means comprising a fan motor for actuating the fan with its rotor, and transmission means therebetween which comprises a fan shaft and a self-aligning bearing in which said fan shaft is rotatably mounted, for constantly centering the fan rotor in a sleeve surrounding said rotor, said driving means being mounted on supporting means rigidly supported by said catch basin, a surface-type dry heat exchanger being disposed under said catch basin on the suction



side of said fan, together with power-driven louvers permitting the cold-weather operation of the tower by causing the water to selectively stream through one of the following paths:

through the cooling tower alone,

through the dry exchanger in order to eliminate a wreath of steam released by conventional cooling towers,

through said dry exchanger and then through the cooling tower.

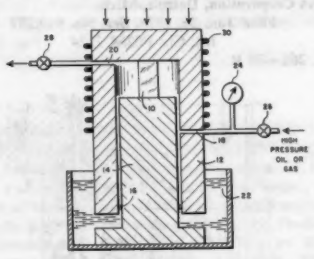
4,217,318
FORMATION OF HALIDE OPTICAL ELEMENTS BY HYDROSTATIC PRESS FORGING

Rogers H. Anderson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 671,192, Mar. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,290, Feb. 28, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,740

Int. Cl.² B29D *11/00*

U.S. Cl. 264—1 **10 Claims**



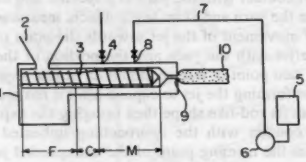
1. In a method of forming a fine-grained halide body by hot press forging an essentially single crystal halide body to reduce a dimension of the halide body along a first axis and cause a corresponding expansion of the halide body in directions normal to the first axis, thereby producing a fine-grained structure in the halide body, the improvement comprising applying, with a fluid which does not chemically react with the halide body, an essentially hydrostatic fluid pressure to the halide body while hot press forging, the fluid pressure being sufficient to inhibit cracking of the halide body while hot press forging.

4,217,319

PROCESS FOR PRODUCING POLYOLEFIN FOAMS

Tetsuo Komori, Utsunomiya, Japan, assignor to Japan Styrene Paper Corporation, Ltd., Tokyo, Japan

Filed Dec. 11, 1978, Ser. No. 967,974
Claims priority, application Japan, Dec. 13, 1977, 52-149529
Int. Cl.[2] B29D 27/00
U.S. Cl. 264—53 2 Claims



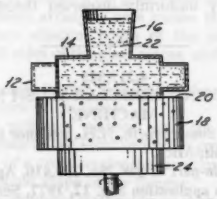
1. In a process for producing a foamed polyolefin article which comprises melting and mixing a polyolefin, a volatile organic blowing agent, a cell size-controlling agent, and an ester of a long-chain fatty acid and a polyhydric alcohol in an extruder comprising a feed zone, a compression zone and a metering zone, and extruding the resultant molten gel into an area having a lower pressure than the pressure of the inside of the extruder, the improvement wherein said ester is at least one glycerol ester of fatty acid having 8 to 20 carbon atoms, and said ester is fed in a molten state into the molten gel within the metering zone at a position nearer to the die exit of the extruder than the injection port for the blowing agent, said position corresponding to an L/D of at least 20 toward a hopper of the extruder from the tip of the screw.

4,217,320

SLIP CAST ARTICLE MANUFACTURING METHOD

Andre Ezis, Grosse Ile, and John M. Nicholson, Wayne, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1976, Ser. No. 753,345
The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.
Int. Cl.[2] B28B 1/26
U.S. Cl. 264—65 6 Claims



1. A method of forming a slip cast article wherein the article has at least one surface area of complex shape, which method comprises the following steps:

forming a first mold portion which will form the surface area of complex shape from a meltable organic material which (a) is readily formable to the negative to the surface area of complex shape, (b) is nonreactive with the material contained in the vehicle of the casting slip to be used to form the article, and (c) provides a smooth pore free surface that the slip can be cast against;

forming other mold portions required to define any noncomplex surfaces of the article to be slip cast;

assembling said first mold portion and any of said other mold portions with a slip vehicle drawing mold portion so that said first mold portion, said other required mold portions and said slip vehicle drawing mold portion define a casting volume which has at least one surface formed by said slip vehicle drawing mold portion;

poring a slip which includes a vehicle and a casting material into said casting volume;

disassembling said first mold portion and any of said other required mold portions from said slip vehicle drawing mold portion when said vehicle of said slip has been reduced to a level which provides for a consolidated casting of said casting material in said casting volume and also provides sufficient vehicle in said consolidated casting that the consolidated casting is resistant to shrinkage;

disassembling any of said other required mold portions which are disassembable from said consolidated casting containing said sufficient vehicle;

engaging at least a portion of said consolidated casting containing said sufficient vehicle with said first mold portion attached thereto with a porous, liquid drawing media;

maintaining a high humidity of said vehicle of said casting slip about said consolidated casting engaged by said porous, liquid drawing media;

heating said consolidated casting and engaging porous, liquid drawing media while said high humidity of said vehicle is maintained to a temperature which causes said meltable organic material forming said first mold portion to melt, said porous, liquid drawing media drawing the melted material away from said consolidated casting;

after said first mold portion has been melted and withdrawn from association with said consolidated casting, removing the high humidity vehicle from association with the consolidated casting; and

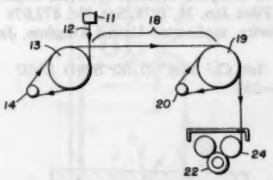
drying said consolidated casting to form a slip cast article.

4,217,321

METHOD FOR MAKING BICOMPONENT POLYESTER YARNS AT HIGH SPINNING RATES

William L. Campbell, Cary, N.C., assignor to Monsanto Company, Decatur, Ala.

Filed Dec. 6, 1978, Ser. No. 966,831
Int. Cl.[2] D01D 5/22; D02G 3/00
U.S. Cl. 264—168 5 Claims



1. The method of making a bicomponent polyester filament having improved bulking potential, comprising:

(a) spinning a bicomponent filament having polyethylene terephthalate as one component and polybutylene terephthalate as the other component, said spinning being carried out at a filament speed in excess of about 3,600 meters per minute,

(b) passing the filament through an isolated zone,

(c) cold drawing the filament 5 to 100 percent in the isolated zone, and

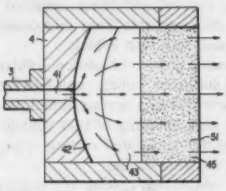
(d) winding up the filament.

4,217,322

PROCESS FOR EXTRUDING SYNTHETIC RESIN AND DIE FOR USE THEREIN

Katsumi Sugano, Kobe; Takeshi Hashimoto, Amagasaki; Shinzi Hashizume, Kobe; Yoshio Ikegami, Miki, and Shin'ichi Fukumizu, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Jul. 14, 1978, Ser. No. 924,556
Claims priority, application Japan, Jul. 14, 1977, 52-84709
Int. Cl.[2] B29B 5/00
U.S. Cl. 264—176 R 11 Claims



1. A process for extruding a synthetic resin, including an extruding die with die lips and a diffusing manifold, said die lips being disposed near the outlet of the resin flow and having frictional resistance relative to the resin in order to restrict the resin flow comprising:

extruding resin through said die;

passing said resin through said die lips; and

providing flow resistance while passing said resin through said die lips so as to eliminate local flow of the resin on the resin flow path surface of the die.

2. A die for extruding a sheet-like synthetic resin which comprises:

an inlet passage formed in said die;

a diffusing manifold communicating with said passage;

a flat flow passage communicating with said diffusing manifold;

first and second die lips communicating with said flat flow passage including sand paper elements bonded onto the inner wall of said first and second die lips, forming a flat flow path therebetween near the outlet of a resin flow in the width direction; and

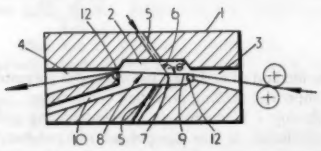
means for adjusting the positioning of at least one of said first and second die lips.

4,217,323

HEATING AND DRAWING OF SYNTHETIC FILAMENTS

Peter W. Foster; Thomas Berry, both of Tiverton, England, and Karel Murenbeeld, Geneva, Switzerland, assignors to John Heathcoat & Company Limited, Tiverton, England

Filed Jan. 25, 1978, Ser. No. 872,076
Claims priority, application United Kingdom, Jan. 27, 1977, 3299/77
Int. Cl.[2] B29C 25/00; B29D 17/02
U.S. Cl. 264—235 6 Claims



1. A method of providing a continuously moving synthetic yarn containing a section of maximum temperature, of substantially constant length and of fixed position in space comprising moving the yarn through an enclosed space between two yarn guides located at opposite ends of the enclosed space and arranged to guide the yarn through the space with substantially no transverse deviation so that the yarn follows a rigidly defined path and heating the portion of yarn between the guides by hot gas in two stages with an abrupt change from one stage to the other, the two stage heating being effected by concentrating the hot gas into at least one discrete high velocity jet a portion of which extends from the point of jet formation and while unconfined by boundary surfaces has a clearly defined rod-like shape, bringing the rod-like portion of the jet into abrupt contact with the yarn at a specific and unchanging position on the yarn and at an angle which, measured between the line of movement of the jet towards the point of intersection of the jet with the yarn and the portion of the yarn approaching said point of intersection is an obtuse angle, permitting the gas forming the jet to expand after it has met the yarn until it loses its rod-like shape then bringing the expanded gas back into contact with the approaching unheated yarn upstream from the meeting point of the unexpanded jet and the yarn.

4,217,324

PROCESS FOR MOLDING ANTIFRICTION NYLON MEMBER

Lennis E. Meek, Portage, Mich., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 707,451, Jul. 21, 1976, Pat. No. 4,096,347.
This application Oct. 11, 1977, Ser. No. 841,174
Int. Cl.[3] B29C 25/00
U.S. Cl. 264—236 9 Claims

1. A method of making an antifriction nylon member comprising the steps of, providing from 35 to 48 parts by weight of molten nylon monomer in a first container with a catalyst, providing from 35 to 48 parts by weight of molten nylon monomer in a second container, mixing from 4 to 10 parts by weight of a liquid lubricant and from 0.10 to 0.20 parts by weight of a surfactant in said second container with the molten nylon monomer therein to form a smooth substantially homogeneous mixture, blending said mixture of said second container with said molten nylon monomer and catalyst of said first container to effect polymerization of said monomer and to define a blend thereof wherein said lubricant is substantially uniformly dispersed throughout the resulting molten nylon by said surfactant, disposing said blend in mold means, and cooling said blend below the solidification temperature of the molten nylon to define said nylon member having said lubricant substantially uniformly dispersed throughout by said surfactant.

4,217,325

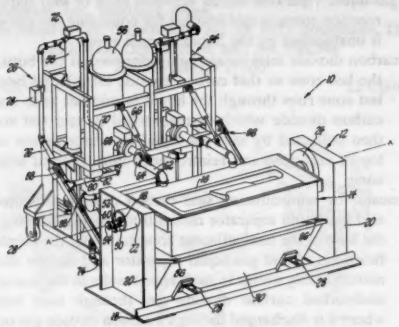
METHOD USING MODULAR SLUSH MOLDING MACHINE

Daniel E. Colby, Somersworth, N.H., assignor to McCord Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 789,410, Apr. 21, 1977, abandoned. This application Sep. 12, 1977, Ser. No. 832,640
Int. Cl.[2] B29C 5/04, 9/00; B29D 9/00
U.S. Cl. 264—245 6 Claims

1. A method for molding an article of heat-fusing material in a mold having first and second groups of fluid passages disposed adjacent the mold surface for controlling the temperature over respective first and second areas of the mold surface, said method comprising the steps of: supplying all of the passages with liquid for maintaining the temperature of the first and second areas of the mold surface at a non-gelling temperature below that required to gel any appreciable thickness of the heat-fusing material, disposing liquid heat-fusing material over the first and second areas of the mold surface, supplying the first group of passages with liquid at a temperature sufficient to raise the temperature of the first area to a higher temperature than the second area for gelling a predetermined thickness of the heat-fusing material over the first area while maintaining said second area at a lower temperature, removing non-gelled

liquid heat-fusing material from the mold, and supplying the first and second passages with liquid at a temperature sufficient



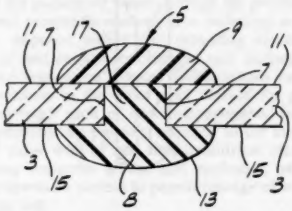
to raise the temperature of the first and second areas to a cure temperature for curing the heat-fusing material disposed thereover.

4,217,326

METHOD FOR MAKING A CUT GLASS PANEL

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

Filed Jul. 2, 1979, Ser. No. 54,169
Int. Cl.[2] B29C *5/00, 9/00;* **B29F** *1/12*
U.S. Cl. 264—254 **6 Claims**



1. A method of making a cut glass panel comprising a plurality of glass pieces arranged with cames in a predetermined pattern between adjacent edges of the pieces and having flanges on both sides of the glass pieces; said method comprising:

providing a mold having grooving in the upper face thereof in the pattern of the cames,

introducing moldable material into the grooving in the upper surface of the mold to fill the grooving, the grooving being of a cross-sectional shape corresponding to the cross-sectional shape of the flanges;

allowing the moldable material to set in the mold to form the flanges for one side of the glass pieces;

removing said flanges from the mold;

positioning the glass pieces on the same or a similar mold with the edges of each glass piece spaced from the edges of the adjacent glass pieces in the predetermined pattern, the spaces between adjacent glass pieces being above the grooving;

introducing sufficient moldable material between the edges of the glass pieces to fill the grooving and to fill the spaces between the adjacent glass pieces;

positioning said flanges on the upper surface of the glass pieces so as to engage the moldable material at the top of the spaces between adjacent glass pieces;

allowing the moldable material to set in the grooving to form the flanges for the other side of the glass pieces, to set in the spaces between the glass pieces to form the webs of the cames and to set at the top of the spaces between the glass pieces, thereby bonding said flanges for said one side of the glass pieces to the webs of the cames; and

removing the glass pieces bonded together by the cames from the mold.

4,217,327

METHOD OF FORMING TEAR LINES IN PLASTIC FILMS

Leo V. Cancio; Gerald W. Miller, both of Cincinnati; Robert M. Mortellite, Hamilton; Anthony R. Steimle, Cincinnati, all of Ohio, and Brian P. Peterson, Syracuse, N.Y., assignors to Clopay Corporation, Cincinnati, Ohio

Filed Mar. 27, 1978, Ser. No. 890,327
Int. Cl.[2] B28B *11/08;* **B65D** *65/28*
U.S. Cl. 264—293 **7 Claims**

1. A method of making plastic film having tear lines for severance thereof comprising

forming a score along a line in a surface of a thermoplastic film to provide a tear line,

reforming the thermoplastic material in said surface of the scored film without eliminating the tear line by the application of heat and pressure to said surface and

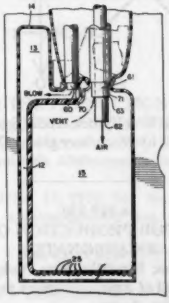
forming a substantially continuous surface layer of said reformed thermoplastic to cover said score.

4,217,328

METHOD OF BLOW MOLDING A BOTTLE WITH A DIFFUSER

Orlando D. Cambio, Jr., Bristol, Wis., assignor to Respiratory Care, Inc., Arlington Heights, Ill.

Division of Ser. No. 904,980, May 11, 1978. This application Nov. 13, 1978, Ser. No. 959,637
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—504 **2 Claims**



1. In a method of blow-molding generally vertically oriented multi-compartmented bottles fabricated from extruded tubular thermoplastic material or the like, wherein the said compartments include a side-by-side pair of longitudinally oriented compartments formed from the tubular material, and which method comprises longitudinally pinching together so as to sealingly join opposite longitudinal side portions of the tubular

material, and blow-molding the pinched-together tubular material within and to subsequently expand it against a blow mold cavity with at least one end closed to form a bottom end of the bottle, the improvement comprising the steps of:

(a) restricting the longitudinal extent of said vertically oriented compartments and generally terminating at least one thereof, which constitutes a basic bottle compartment, in an enclosed manner laterally adjacent the other of said side-by-side compartments, and in a spaced relation from the bottom end of the bottle;

(b) forming a separate lower compartment transversely to and essentially bridging across said longitudinally oriented compartments by also laterally pinching together a lower portion of the tubular material toward the bottom of the bottle under formation by:

(1) horizontally moving together toward a vertical plane laterally opposed multiple discontinuous edges and thereby;

(2) moving together and joining corresponding opposed portions of the tubular material along a horizontally disposed plane with relatively closely spaced thick and less thick portions so as to form said transverse lower compartment in a manner providing a lower compartment separated from said basic compartment;

(3) providing air under pressure into said transverse lower compartment whereby a plurality of openings are produced at the said thick portions where said tubular material has been pinched at that area of tubular material in confrontation with the discontinuous portion of the said discontinuous edges;

(4) and introducing a liquid directly into said basic compartment prior to finishing the blow molding operation.

4,217,329

SULFONE CONTAINING QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES

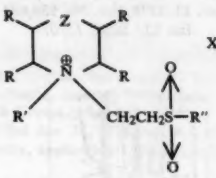
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 886,183, Mar. 13, 1978, Pat. No. 4,146,711. This application Dec. 4, 1978, Ser. No. 966,248

Int. Cl.² C23F *11/04*

U.S. Cl. 422—12 **5 Claims**

1. A process inhibiting corrosion which comprises treating a system with a composition characterized by the formula



where R is hydrogen, or a hydrocarbon group, R′ is a hydrocarbon group, R″ is a hydrocarbon group, Z is S, SO, or SO_2 and X is an anion.

4,217,330

APPARATUS FOR PRODUCTION OF SODIUM BICARBONATE

Keiichi Nakaya, Chiba; Kimihiko Sato, Yokohama, and Kenji Konishi, Ichihara, all of Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed Sep. 15, 1975, Ser. No. 613,439

Claims priority, application Japan, Sep. 13, 1974, 49-104881

Int. Cl.² B01J *10/00*

U.S. Cl. 422—193 **4 Claims**

1. A reactor for the production of sodium bicarbonate, which comprises:

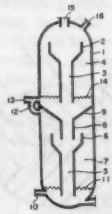
a housing having a plurality of reaction zones in vertical alignment being placed in vertical sequence from a last zone to a first zone, each being in liquid and gas flow communication with each adjacent zone;

gas-liquid separator means between each of said sequential reaction zones in said housing for collecting the gas which is unabsorbed by the liquid in each zone;

carbon dioxide inlet means being disposed at the bottom of the last zone so that carbon dioxide introduced into said last zone rises through the liquid in said last zone and the carbon dioxide which is unabsorbed in said last zone is then collected by said gas-liquid separator means at the top of said zone and reintroduced into the next adjacent zone;

means for reintroducing said carbon dioxide collected by said gas-liquid separator means through said housing into the base of the next adjacent zone such that the combined functions of said gas-liquid separator and carbon dioxide reintroducing means in each zone results in the passage of unabsorbed carbon dioxide gas through said housing where it is discharged through a carbon dioxide gas outlet;

inlet means for feeding an ammoniacal brine or a mother liquor to be carbonated into the top of the first zone, countercurrently to the upper movement of the carbon dioxide gas in said first zone, wherein said brine or mother liquor is passed downwardly through said first zone and continues by force of gravity to pass sequentially downward into each successive zone to effect countercurrent contact with the upper rising carbon dioxide in each of said zones;



recirculation means within said housing being associated with each zone, said recirculation means having a liquid inlet situated at the top of said zone and a liquid outlet at the bottom of said zone, which confines the gravity controlled downward flow of liquid to the portion of the zone traversing the recirculation means;

carbon dioxide sparger means situated at the bottom of each zone through which carbon dioxide, which has been admitted into the bottom of each zone from said carbon dioxide reintroduction means, is introduced into each zone at sufficient force such that a portion of the liquid within said zone is forced upwardly into proximity of the inlet to the recirculation means so that a portion of the liquid is continually introduced into said recirculation means, wherein said gas-liquid separator disposed between each of said adjacent zones prevents the upwardly forced liquid from reentering the preceeding zone by directing said upwardly forced liquid back to said zone; and

product outlet means disposed in proximity to the bottom of said last zone for recovery of crystallized sodium bicarbonate-containing slurry; wherein said recirculation means, being associated with each zone, comprises a pipe with an enlarged inlet opening at one end and a thinner outlet opening at an opposite end and wherein said carbon dioxide sparger means includes an annular gas distributing plate, having fine holes or slits, interconnecting said recirculation means and said housing for distributing gas in said zones.

4,217,331

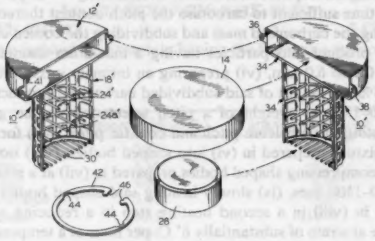
DISPOSABLE FLOAT DISPENSER

Charles T. Schaub, Woodcliff Lake, N.J., assignor to Coleco Industries, Inc., Hartford, Conn.

Continuation of Ser. No. 816,281, Jul. 18, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 948,044

Int. Cl.[2] B01D *11/00*

U.S. Cl. 422—265 12 Claims



1. In a float dispenser, the combination comprising:

(a) a flotation element having a lower wall portion and a density less than that of water:

(b) a receptacle element depending from said lower wall portion of said flotation element and supported thereby, said receptacle element being a generally cylindrical cage comprised of a pair of vertically extending mating semi-cylindrical members locked together, said receptacle element having an outer wall defining an enclosure with apertures disposed over substantially the entire surface thereof for passage of water through the provided enclosure, said receptacle element also including at least one divider disposed within and extending across the full width of said enclosure to divide said enclosure into at least two segregated storage compartments each having said apertures in the outer wall thereof for passage of water through each of said compartments, said divider being provided by portions attached to the inner surface of said outer wall of said semi-cylindrical members and extending inwardly across said enclosure, said divider having apertures therein to permit passage of water therethrough; and

(c) at least one tablet of water-soluble material disposed within said receptacle, each of said compartments containing not more than one of said tablets; said dispenser being disposable and said divider cooperating with said outer wall to fully segregate said compartments whereby to retain and segregate each said tablet within its associated compartment, said apertures in said outer wall and said divider permitting water to flow through said outer wall and divider into contact with substantially the entire surface of said tablet in any one of said compartments.

4,217,332

PROCESS FOR EXCHANGING HYDROGEN ISOTOPES BETWEEN GASEOUS HYDROGEN AND WATER

Saul G. Hindin, Mendham, and George W. Roberts, Westfield, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Jun. 17, 1976, Ser. No. 697,236

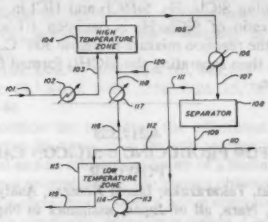
Int. Cl.[2] B01D *59/33*

U.S. Cl. 423—249 32 Claims

1. A process for exchanging isotopes of hydrogen between water and gaseous hydrogen comprising:

(a) (i) introducing hydrogen gas depleted in said isotope, and water in the vapor phase, said water containing an isotope of hydrogen, into a first reaction zone, contacting in said zone in co-current flow at a temperature in the range of from about 225° C. to about 300° C. said water vapor and hydrogen gas with a supported metal catalyst, withdrawing from said zone an effluent stream comprising a mixture of hydrogen gas enriched in said isotope and water vapor depleted in said isotope, and condensing said water vapor to liquid water; or

(a) (ii) introducing hydrogen gas depleted in said isotope and liquid phase water, said water containing an isotope of hydrogen, into a first reaction zone, contacting in said zone in counter-current flow at a temperature of about 100° C. said liquid phase water and hydrogen gas with a hydrophobic catalyst comprising a coherent film of a hydrophobic polymer, said film being disposed on a low surface area support and containing at least one finely divided catalytically active metal of Group VIII of the Periodic Table on a high surface area carrier and withdrawing from said first reaction zone a stream of hydrogen gas enriched in said isotopes and liquid water depleted in said isotope; and



(b) introducing a hydrogen gas enriched in said isotope withdrawn from said first reaction zone and liquid water containing said isotope into a second reaction zone, contacting in said second reaction zone in counter-current flow at a temperature in the range from about 0° C. to about 50° C. said liquid water and said hydrogen gas enriched in said isotope with a hydrophobic catalyst comprising a coherent film of a hydrophobic polymer, said film being disposed on a low surface area support and containing at least one finely divided catalytically active metal of Group VIII of the Periodic Table on a high surface area carrier and withdrawing from said second reaction zone a liquid water effluent stream enriched in said isotope and a hydrogen gas depleted in said isotope.

4,217,333

PROCESS FOR THE PRODUCTION OF POTASSIUM MAGNESIUM PHOSPHATE

Karl-Richard Löblich, Hannover, Fed. Rep. of Germany, assignor to Kali and Salz Aktiengesellschaft, Kassel, Fed. Rep. of Germany

Filed Jul. 17, 1979, Ser. No. 58,338

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1978, 2831672

Int. Cl.[2] C01B *25/26*

U.S. Cl. 423—306 17 Claims

10. A process for the production of potassium magnesium phosphate which comprises reacting under aqueous conditions and at a pH below 9 (a) mono or dibasic magnesium phosphate, (b) potassium chloride, and (c) an alkaline magnesium compound, in the presence of less than 130 g per liter of $MgCl_2$ and other soluble magnesium compounds and in the presence of an amount of potassium chloride substantially in excess of the $MgCl_2$ and other soluble magnesium compounds, whereby the production of tribasic magnesium phosphate is suppressed.

4,217,334

PROCESS FOR THE PRODUCTION OF CHLOROSILANES

Wolfgang Weigert, Offenbach; Eugen Meyer-Simon, Frankfurt, and Rudolf Schwarz, Wasserlos, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 328,362, Jan. 31, 1973, Pat. No. 4,165,363. This application Dec. 27, 1978, Ser. No. 973,629

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1972, 2209267

Int. Cl.[2] C01B *33/08*

U.S. Cl. 423—342 **14 Claims**

1. A process of producing hydrogen containing chlorosilanes in which silicochloroform is the predominant chlorosilane formed consisting essentially of reacting $SiCl_4$ with H_2 alone at 600° and 1200° C. with a residence time in the reaction zone of 0.5 to 20 seconds to form a reaction equilibrium mixture containing $SiCl_4$, H_2, $SiHCl_3$ and HCl in which process the molar ratio of $SiCl_4/H_2$ is between 1:1 and 1:50, then quenching the reaction mixture to below 300° C., in less than 1 second and then separating the $SiCHl_3$ formed from the reaction mixture.

4,217,335

PROCESS FOR PRODUCING β-SILICON CARBIDE FINE POWDER

Tadao Sasaki, Takarazuka; Isamu Komaru, Ashiya, and Ryuzo Yoshioka, Nara, all of Japan, assignors to Nippon Crucible Co., Ltd., Tokyo, Japan

Filed Jun. 14, 1979, Ser. No. 48,563

Int. Cl.[2] C01B *31/36*

U.S. Cl. 423—345 **7 Claims**

1. A process for producing a β-silicon carbide fine powder which comprises mixing carbon powder having a particle size of 20 μm or less, silicon powder and silica powder to form a mixture whose composition falls within the region defined by the lines connecting O (C: 62.4, Si: 37.4, SiO_2: 0.2), P (C: 34.9, Si: 64.9, SiO_2: 0.2), Q (C: 50, Si: 41, SiO_2: 9) and R (C: 68, Si: 23, SiO_2: 9) of the FIG. The quantities of C, Si and $SiO_2$of O, P, Q and R being expressed in Mol%, filling the mixture in a heat refractory reactor and heating it is an oxidizing atmosphere having an oxygen content of about 0.3 to 35% by volume to a temperature of about 800 to 1,450° C. to induce a spontaneous chain reaction and effect the formation of β-silicon carbide.

4,217,336

ARTIFICIAL GRAPHITE

Jacques Maire, Epinay sur Seine; Jacques Fourre, and Jean P. Gervais, Noisy le Sec, all of France, assignors to Le Carbone-Lorraine, Gennevilliers, France

Continuation-in-part of Ser. No. 698,026, Jun. 21, 1976, abandoned. This application Jun. 2, 1978, Ser. No. 911,908

Claims priority, application France, Jun. 24, 1975, 75 19678

Int. Cl.[2] C01B *31/04, 31/02*

U.S. Cl. 423—448 **6 Claims**

1. An artificial dual-textured graphite having a coarse grained macrostructure in which each of the coarse grains of graphite is formed from a number of strongly bonded ultrafine grains of graphite, the maximum size of each of said coarse grains being from 0.4 to 6.0 mm. and each of the dimensions of the ultrafine grains is less than 0.050 mm. said ultrafine grains being bonded together by graphitized pore-containing carbon in which the average size of the pores is less than 2μ and said coarse grains are bonded together by graphitized pore-containing carbon in which the average size of the pores is from 5 to 20μ, said graphite being further characterised by a coefficient of linear expansion within the range of $4\text{-}6\times10^{-6}$/°C., a thermal conductivity of substantially 0.20CAL/CM/°C./sec, an electrical resistivity within the range of 1500 to 2000 μΩ/cm and an anisotropy factor not exceeding 1.4, said graphite having been produced by a process which consists essentially of (i) preparing an intimate mixture of (a) 20–30% by weight of a pitch selected from the group consisting of petroleum pitch and coal tar pitch and (b) 80–70% by weight of a finely divided coke selected from petroleum coke and coal tar coke having a particle size of less than 0.050 mm., (ii) forming said mixture into shaped bodies, (iii) isostatically compressing said shaped bodies at a pressure within the range of 500–1500 bars, (iv) slowly heating said shaped bodies in a first heating step in a reducing atmosphere at a rate of substantially 4° C. per hour for a time sufficient to carbonise the pitch content thereof, (v) cooling the carbonised mass and subdividing the cooled carbonised product into particles having a maximum diameter of from 0.4 to 6.0 mm, (vi) preparing an intimate mixture of (c) 80–85% by weight of said subdivided carbonised product and (d) 20–15% by weight of a pitch selected from the group consisting of petroleum pitch and coal tar pitch, (vii) forming the mixture prepared in (vi) into shaped bodies, (viii) isostatically compressing shaped bodies prepared in (vii) at a pressure of 500–1500 bars, (ix) slowly heating said shaped bodies prepared in (viii) in a second heating step in a reducing atmosphere at a rate of substantially 6° C. per hour at a temperature of 850°–1100° C. for a time sufficient to carbonise the pitch content thereof, and (x) further heating the carbonised product prepared under (ix) to effect graphitisation thereof in an inert atmosphere at temperatures up to 3000° C.

4,217,337

PROCESS FOR MANUFACTURING AN ALUMINA SUBSTRATE BY ACID PURIFYING A PREFIRED SUBSTRATE BEFORE FINAL FIRING

Seiichi Yamada; Nobuo Kamehara, both of Machida, and Kyohei Murakawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Japan

Filed Oct. 30, 1978, Ser. No. 955,761

Claims priority, application Japan, Oct. 31, 1977, 52/129657

Int. Cl.[2] C01F *7/02;* C04B *35/44*

U.S. Cl. 423—626 **17 Claims**

1. A process for manufacturing an alumina substrate, from alumina powder produced by the Bayer method, said process comprising the steps of:

providing a green sheet formed from said alumina powder;

purifying said green sheet of alumina by prefiring said green sheet at a temperature in the range from 1200° to 1350° C. and treating said prefired substrate with an acid aqueous solution; and

firing said acid-treated substrate.

4,217,338

NOVEL SUPPORTS CARRYING SIDE CHAINS, PROCESSES FOR OBTAINING THESE SUPPORTS, PROCESS FOR ATTACHING ORGANIC COMPOUNDS HAVING CARBOHYDRATE RESIDUES ON SAID SUPPORTS, PRODUCTS AND REAGENTS RESULTING FROM SAID CHEMICAL FIXATION

Gerard A. Quash, Sainte Foy les Lyon, France, assignor to Institut National de la Sante et de la Recherche Medicale - Inserm, Paris, France

Filed Nov. 11, 1976, Ser. No. 740,840

Claims priority, application France, Nov. 13, 1975, 75 34627; Mar. 26, 1976, 76 08966; Aug. 27, 1976, 76 25898

Int. Cl.[2] G01N *33/16;* A61K *43/00, 39/00*

U.S. Cl. 424—1 **40 Claims**

1. A product obtained by coupling (1) an organic compound containing carbohydrate residues and (2) an insoluble solid support carrying at least one reactive —NH_2 group, and wherein the organic compound is bound through its carbohydrate residues, of which at least one —CH_2OH function has previously been converted, by oxidation, into a —CHO function, to said reactive —NH_2 groups which are carried by a side chain bound to said insoluble solid support.

4,217,339

GLYCOPROTEIN AND PROCESS FOR ISOLATING IT

Hans Bohn, Marburg an der Lahn, and Wilhelm Winckler, Wenkbach, both of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 903,006

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720704

Int. Cl.[2] C07G *7/026;* A61K *39/00*

U.S. Cl. 424—12 5 Claims

1. An isolated glycoprotein having the following amino acid analysis:

	Frequency (Mole %)	Variation Coefficient (%)
Lysine	0.67	39.25
Histidine	3.36	9.97
Arginine	5.09	6.58
Aspartic acid	5.87	3.07
Threonine	3.83	15.74
Serine	7.84	8.22
Glutamic acid	11.76	1.35
Proline	6.46	1.71
Glycine	10.24	4.49
Alanine	11.25	3.76
Cystine/2	5.10	6.34
Valine	6.87	5.18
Methionine	0.42	14.48
Isoleucine	2.47	5.07
Leucine	11.42	4.23
Tyrosine	2.95	5.45
Phenylalanine	2.42	13.52
Tryptophan	1.98	11.37

and the following properties:

(a) a protein content of 89±4%;

(b) a carbohydrate content of 11.1 ±2.2%; including 5.3±1.1% of hexoses, 2.8±0.5% of N-acetylated hexosamine, and 2.9±0.6% of N-acetylated neuraminic acid;

(c) a sedimentation coefficient, $S_{20\ w}$, of 3.2±0.3 S;

(d) a molecular weight of 32,000±6000;

(e) an isoelectric point of pH 4.3±0.3;

(f) an extinction coefficient, $E_{1\ cm}^{1\%}$ (280 nm), of 13.8±1.0;

(g) an electrophoretic mobility in the range between albumin and the α_1-globulins;

(h) a specific immunologic reaction with an antibody directed specifically against the glycoprotein;

(i) proteolytic activity.

4,217,340

RAPID ACTING COMBINATION OF PHENYL BENZOIC ACID COMPOUNDS AND MAGNESIUM HYDROXIDE

Jonathan A. Tobert, Plainsboro, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

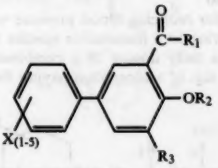
Filed Mar. 21, 1979, Ser. No. 22,384

Int. Cl.[2] A61K *31/60, 31/605, 33/08*

U.S. Cl. 424—157 8 Claims

1. In combination:

(a) from 5 to 60% by weight of a phenyl benzoic acid compound of the general formula:



wherein

$X_{(1-5)}$ is halo; X being on one or more of the phenyl carbon atoms;

R_1 is selected from the group consisting of hydroxy, phenoxy, diloweralkylamino, and diloweralkylamino loweralkoxy;

R_2 is selected from the group consisting of hydrogen and lower alkanoyl; and

R_3 is selected from the group consisting of hydrogen and methyl;

and pharmaceutically acceptable, non-toxic salts thereof; and

(b) from 95 to 40% by weight of magnesium hydroxide.

4,217,341

COMPOSITION AND METHOD FOR INHIBITING THE ADHERENCE OF DENTAL PLAQUE-PRODUCING BACTERIA TO SMOOTH SURFACES

Richard P. Suddick; Robert H. Staat, and Ronald J. Doyle, all of Louisville, Ky., assignors to The University of Louisville, Louisville, Ky.

Filed Dec. 7, 1977, Ser. No. 858,182

Int. Cl.[2] A61K *9/68, 7/16, 7/26, 35/78*

U.S. Cl. 424—48 19 Claims

1. A composition for inhibiting the adherence of dental-plaque producing bacteria to a smooth surface including a carrier material and an effective quantity of a lectin, said lectin being of the type exemplified by the extract obtained by grinding the seed of a plant chosen from a group comprising *Arachis hypogaea, Persea americana, Mangiferia indicia, Cucurbito pepo,* or *Phaseolus vulgaris* in a phosphate-saline buffer solution, said lectin being present in a concentration equivalent to a hemagglutination titer of 1:128, whereby said lectin reduces the adherence of said bacteria to a value less than 50 percent as tested by the glass vial technique.

4,217,342

MAGNESIUM POLYCARBOXYLATE COMPLEXES AS ANTICALCULUS AGENTS

Abdul Gaffar, and Maria C. S. Gaffar, both of Somerset, N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 861,795, Dec. 12, 1977, Pat. No. 4,183,914.

This application May 25, 1979, Ser. No. 42,484

Int. Cl.[2] A61K *9/68, 7/16*

U.S. Cl. 424—48 7 Claims

1. An oral composition comprising a dental cream, mouthrinse, troche or lozenge, chewing gum, dental tablet or powder or mouthspray containing as the essential anticalculus agent, a magnesium polycarboxylate complex of a magnesium compound and a polycarboxylate compound in the ratio of 1:40 to about 4:1 magnesium compound to polycarboxylate and having a pH of about 4.5–7.8, wherein said polycarboxylate contains ionizable carboxyl groups and is a sulfoacrylic oligomer having an average molecular weight of less than 1000 and is ionically bound to a dissociable, physiologically acceptable magnesium compound, wherein said magnesium compound constitutes about 0.01–5% by weight and the polycarboxylate constitutes about 0.1–10% by weight of the composition.

4,217,343

MAGNESIUM POLYCARBOXYLATE COMPLEXES AS ANTICALCULUS AGENTS

Abdul Gaffar, and Maria C. S. Gaffar, both of Somerset, N.J., assignors to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 861,795, Dec. 12, 1977, Pat. No. 4,183,914.

This application May 25, 1979, Ser. No. 42,485

Int. Cl.[2] A61K *9/68, 7/16*

U.S. Cl. 424—48 7 Claims

1. An oral composition comprising a dental cream, mouthrinse, troche or lozenge, chewing gum, dental tablet or powder or mouthspray containing as the essential anticalculus agent, a magnesium polycarboxylate complex of a magnesium compound and a polycarboxylate compound in the ratio of 1:40 to

about 4:1 magnesium compound to polycarboxylate and having a pH of about 4.5–7.8, wherein said polycarboxylate contains ionizable carboxyl groups and is tricarboxy-oxa-butanol or pentanol and is ionically bound to a dissociable, physiologically acceptable magnesium compound, wherein said magnesium compound constitutes about 0.01–5% by weight and the polycarboxylate constitutes about 0.1–10% by weight of the compound.

4,217,344

COMPOSITIONS CONTAINING AQUEOUS DISPERSIONS OF LIPID SPHERES

Guy Vanlerberghe, Commune de Villevaude, and Rose-Marie Handjani, Paris, both of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 700,038, Jun. 25, 1976, abandoned. This application Dec. 29, 1977, Ser. No. 865,499

Claims priority, application Belgium, Jun. 23, 1976, 168219; France, Nov. 15, 1977, 77 34249

Int. Cl.[2] A61K *7/44, 7/021*

U.S. Cl. 424—60 **9 Claims**

1. A composition comprising a mixture of at least two aqueous dispersions of spheres, each dispersion of spheres comprising arranged molecular layers of a lipid material encapsulating an aqueous phase containing a cosmetically active substance, said lipid material comprising at least one lipid compound having the formula X—Y, wherein Y represents a lipophilic group and X represents a non-ionic hydrophilic group, in which case the diameter of the spheres is between about 100 and 50,000 Å, or an ionic hydrophilic group, in which case the diameter of the spheres is between about 1,000–50,000 Å, the said active substance contained in the encapsulated aqueous phase of the spheres in one of said dispersions being a solar filter and the active substance contained in the encapsulated aqueous phase of the spheres in another of said dispersions being a skin coloring agent.

2. The composition of claim 1 wherein the solar filter is 4-trimethylammonio benzylidene camphor and the skin coloring agent is a mixture of dihydroxyacetone and tartaric aldehyde.

4,217,345

3-O-(β-D-GLUCURONOPYRANOSYL)-SOYASAPOGENOL B

Masanao Shinohara, Naruto; Yoshimasa Nakano, Tokushima; Hirotsugu Kaise, Tokushima; Taketoshi Izawa, Tokushima, and Wasei Miyazaki, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

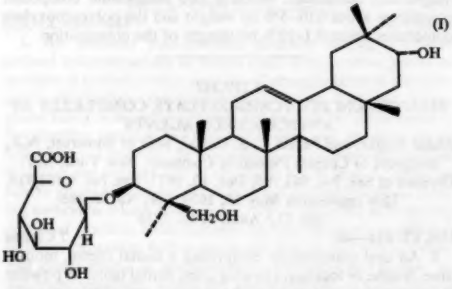
Filed Mar. 30, 1979, Ser. No. 25,518

Claims priority, application Japan, Mar. 31, 1978, 53-38536

Int. Cl.[2] A61K *31/70;* **C07H** *15/24, 15/20*

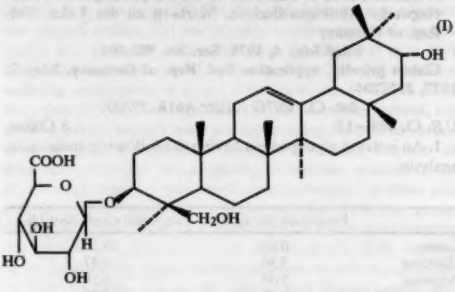
U.S. Cl. 424—180 **5 Claims**

1. 3-O-(β-D-glucuronopyranosyl)-soyasapogenol B represented by the formula (I):



and pharmaceutically acceptable salts thereof.

2. A pharmaceutical composition having anticomplementary activity in animals comprising a therapeutically effective amount of the soyasapogenol derivative of the formula (I) or a pharmaceutically acceptable salt thereof



and a pharmaceutically acceptable carrier.

4,217,346

ARYLALKYL AND ARYLOXYALKYL PHOSPHONATES AS ANTIVIRAL AGENTS

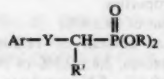
Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 912,502, Jun. 5, 1978. This application Apr. 5, 1979, Ser. No. 27,257

Int. Cl.[2] A61K *31/66;* **C07F** *9/40*

U.S. Cl. 424—214 **13 Claims**

1. A compound having the formula



wherein

Ar is phenyl or phenyl substituted by one or two substituents selected from the group consisting of halogen, lower-alkoxy of 1 to 4 carbon atoms, hydroxy, alkanoyloxy of 1–4 carbon atoms, carbo-lower-alkoxy of 2–4 carbon atoms, carbamyl and carboxy;

Y is $(CH_2)_m$ or $O(CH_2)_m$ where m is an integer from 3 to 10;

R is alkyl of 1–6 carbon atoms; and

R' is alkanoyl or carboalkoxy of from 2 to 4 carbon atoms.

2. A method for combatting viruses which comprises contacting the locus of said viruses with an antivirally effective amount of at least one compound according to claim 1.

4,217,347

METHOD OF TREATING HYPERTENSION AND MEDICAMENTS THEREFOR

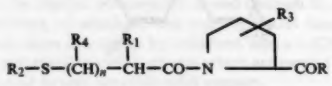
Zola P. Horovitz, Princeton, and Bernard Rubin, Lawrence Township, Cumberland County, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 864,428, Dec. 27, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 958,062

Int. Cl.[2] A61K *31/54, 31/415*

U.S. Cl. 424—246 **25 Claims**

1. A method for reducing blood pressure which comprises orally administering to a mammalian species having elevated blood pressure a daily dosage of a combination comprising about 30 to 600 mg. of a compound having the formula



wherein:

R is hydroxy, lower alkoxy or NH_2;

R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl;

R_2 is hydrogen or R_5-CO;

R_3 is hydrogen, hydroxy or lower alkyl;

R_5 is lower alkyl, phenyl or phenyl-lower alkyl; and

n is 0, 1 or 2

and about 15 to 300 mg. of a diuretic selected from the group consisting of chlorothiazide, hydrochlorothiazide, flumethiazide, amiloride, hydroflumethiazide, bendroflumethiazide, methyclothiazide, trichlormethiazide, polythiazide, benzthiazide, ethacrynic acid, tricrynafen, chlorthalidone, furosemide, bumetanide, triamterene and spironolactone or salts of said compounds.

4,217,348

CEPHALOSPORINS HAVING AN OXAZOLIDONYLOXAMIDO SUBSTITUTED ACYL SIDECHAIN

Uwe D. Treuner, and Hermann Breuer, both of Regensburg, Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

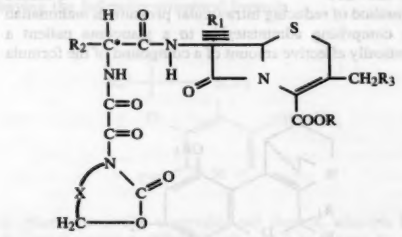
Filed Sep. 28, 1978, Ser. No. 946,479

The portion of the term of this patent subsequent to Oct. 2, 1996, has been disclaimed.

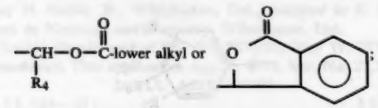
Int. Cl.[2] A61K *31/545;* C07D *501/34, 501/36, 501/46*

U.S. Cl. 424—246 16 Claims

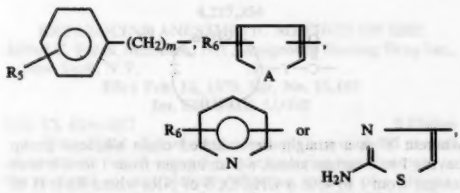
1. A compound of the formula



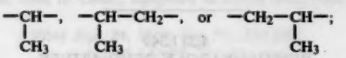
wherein R is hydrogen, sodium, potassium, t-butyl, benzyl, p-methoxybenzyl, p-nitrobenzyl, diphenylmethyl, 2,2,2-trichloroethyl, trimethylsilyl, —CH_2—O-lower alkyl,



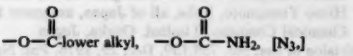
R_1 is in the α-configuration and is hydrogen or methoxy; R_2 is hydrogen, lower alkyl, cycloalkyl, cycloalkenyl, cycloalkadienyl,



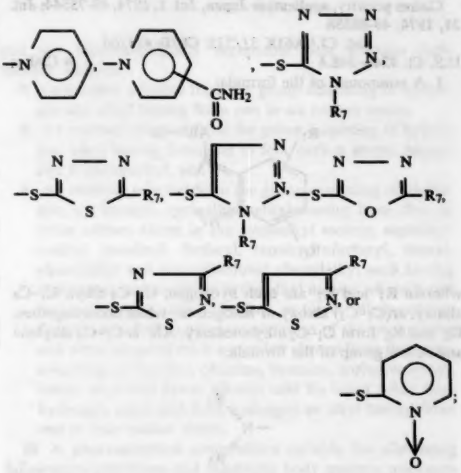
R_4 is hydrogen or lower alkyl; R_5 is hydrogen, methyl, ethyl, methoxy, ethoxy, hydroxy, Cl or Br; m is zero, 1 or 2; A is O or S; R_6 is hydrogen, methyl, ethyl, Cl or Br; X is —CH_2—, —CH_2—CH_2—,



R_3 is hydrogen,

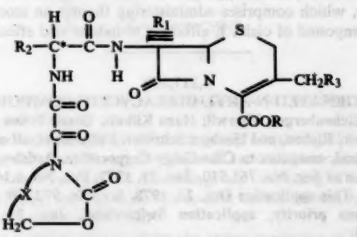


—O-lower alkyl,

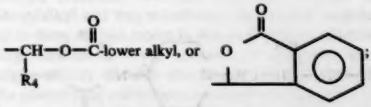


R_7 is hydrogen, lower alkyl, —$(CH_2)_n$—$COOR_8$, —$(CH_2)_n$—SO_3R_8, or —$(CH_2)_n$—$(CH_3)_2$; n is an integer from 1 to 4; and R_8 is hydrogen, sodium or potassium.

14. An antibacterial pharmaceutical composition comprising a pharmaceutically acceptable carrier and one or more antibacterially active compounds of the formula:



wherein R is hydrogen, sodium, potassium, —CH_2—O-lower alkyl,



and R_1, R_2, R_3, R_4 and X are as defined in claim 1.

15. The method of treating bacterial infections in mammals which comprises internally administering an effective amount of the composition of claim 14.

4,217,349
BENZISOXAZOLE DERIVATIVES

Junki Katsube, Toyonaka; Tsuyoshi Kobayashi, Niigata; Katsumi Tamoto; Yoshiaki Takebayashi, both of Takarazuka; Kikuo Sasajima, Toyonaka; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

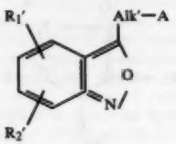
Division of Ser. No. 755,139, Dec. 29, 1976, Pat. No. 4,122,176, which is a continuation-in-part of Ser. No. 590,149, Jun. 25, 1975, abandoned. This application Jun. 26, 1978, Ser. No. 919,221

Claims priority, application Japan, Jul. 1, 1974, 49-75544; Jul. 31, 1974, 49-88556

Int. Cl.[2] A61K *31/535;* C07D *413/06*

U.S. Cl. 424—248.4 8 Claims

1. A compound of the formula:



wherein R_1' and R_2' are each hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, ar(C_1–C_3) alkoxy or halogen or, when taken together, R_1' and R_2' form C_1–C_2 alkylenedioxy, Alk' is C_1–C_4 alkylene and A is a group of the formula:

wherein R_3 and R_4 are each C_1–C_4 alkyl or, when taken together with the adjacent nitrogen atom, R_3 and R_4 form a pyrrolidino, piperidino or morpholino ring.

8. A method for inducing a central nervous system depressing, muscle relaxing, vasodilating, bronchodilating, spasmogenic, analgesic, anti-narcotic, anti-arrhythmic, local anesthetic or anti-platelet aggregation effect in animals or human beings, which comprises administering thereto an amount of the compound of claim 1, effective to induce said effect.

4,217,350
OXYGENATED N-ARYL-DIAZACYCLIC COMPOUNDS

Kurt Eichenberger, Therwil; Hans Kühnis, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Füllinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

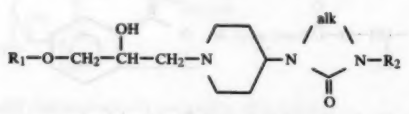
Division of Ser. No. 761,510, Jan. 21, 1977, Pat. No. 4,144,344. This application Dec. 22, 1978, Ser. No. 972,589

Claims priority, application Switzerland, Jan. 21, 1976, 702/61

Int. Cl.[2] A61K *31/495;* C07D *401/14*

U.S. Cl. 424—250 8 Claims

1. Oxygenated N-aryldiazacyclic compounds of the formula



(I)

wherein

R_1 represents pyrazinyl which is unsubstituted or substituted by a memeber selected from the group consisting of lower alkyl, lower alkoxy, lower alkylthio and halogen,

R_2 represents a phenyl or naphthyl group which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, halogen-lower alkyl, lower alkoxy, halogen, lower alkanoyl, lower alkoxycarbonyl, carbamoyl, N-lower alkylcarbamoyl, N,N.-di-lower alkylcarbamoyl, nitro and di-lower alkylamino, or represents pyridyl which is unsubstituted or substituted by a member selected from the group consisting of lower alkyl, lower alkoxy and halogen, and alk represents ethylene, or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition useful in the treatment of hypertension in a warmblooded animal comprising a therapeutically effective amount of a compound according to claim 1 or of a pharmaceutically acceptable acid addition salt thereof together with a pharmaceutical carrier.

4,217,351
BENZOPYRANO QUINUCLIDINES USEFUL AS ANTIGLAUCOMA AGENTS

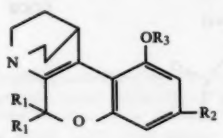
Anthony T. Dren, Waukegan, and Barbara A. Bopp, Lake Bluff, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 711,749, Aug. 4, 1976, Pat. No. 4,136,183. This application Oct. 2, 1978, Ser. No. 948,058

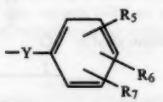
Int. Cl.[2] A61K *31/435*

U.S. Cl. 424—256 2 Claims

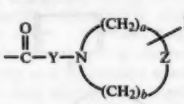
1. A method of reducing intra-ocular pressure in mammalian patients comprising administering to a glaucoma patient a therapeutically effective amount of a compound of the formula



wherein each R_1 is loweralkyl and when taken together the substituents R_1R_1 form oxygen; R_2 is a C_1–C_{20} straight or branched chain alkyl, cycloalkyl, or



wherein Y is a straight or branched chain alkylene group having from 1 to 10 carbon atoms, and each R_5, R_6 and R_7 are the same or different members of the group consisting of H, halo or loweralkyl; and R_3 is



wherein Y' is a straight or branched chain alkylene group having 1 to 8 carbon atoms, a is an integer from 1 to 4, b is an integer from 1 to 4, Z is CH_2, O, S or NR_9 where R_9 is H or loweralkyl, with the provision that when Z is O, S or NR_9, the sum of a and b is 3 or 4, and R_8 is H or loweralkyl; and the pharmaceutically acceptable salts thereof.

4,217,352

ANTI-INFLAMMATORY 4H-1,3-OXATHIINO(4,5-c)

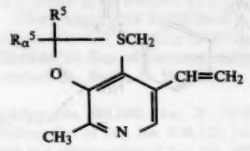
Tsung-Ying Shen, Westfield; Howard Jones, Holmdel, and Conrad P. Dorn, Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 842,692, Oct. 17, 1977, Pat. No. 4,144,312, which is a division of Ser. No. 706,033, Jul. 16, 1976, Pat. No. 4,061,759, which is a division of Ser. No. 578,692, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,011, Apr. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 368,772, Jun. 15, 1973, abandoned. This application Feb. 7, 1979, Ser. No. 10,099

Int. Cl.[2] C07D *411/04;* A61K *31/44*

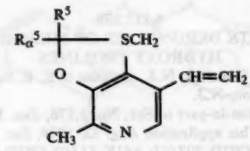
U.S. Cl. 424—256 3 Claims

1. The compound of formula:



or pharmaceutically acceptable salt thereof, wherein R^5 and $R_\alpha{}^5$ are the same or different and each is hydrogen, C_{1-6} alkyl, phenyl, dimethylphenyl, or difluorophenyl.

2. A method of treating rheumatoid arthritis which comprises the administration to a warm-blooded animal or human in need of such treatment an effective amount of a compound having the following structural formula



or pharmaceutically acceptable salt thereof, wherein R^5 and $R_\alpha{}^5$ are the same or different and each is hydrogen, C_{1-6} alkyl, phenyl, dimethylphenyl, or difluorophenyl.

4,217,353

METHOD FOR INDUCING ANOREXIA

Dewey H. Smith, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 907,825, May 19, 1978, abandoned. This application Apr. 6, 1979, Ser. No. 27,270

Int. Cl.[2] A61K *31/485*

U.S. Cl. 424—260 3 Claims

1. A method for exerting an anorexigenic effect in a mammal which comprises orally administering to said mammal an effective anorexigenic amount of naltrexone or a pharmaceutically effective salt thereof.

4,217,354

KETAZOCINE ANESTHETIC METHOD OF USE

Alfred E. Farah, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,107

Int. Cl.[2] A61K *31/445*

U.S. Cl. 424—267 5 Claims

1. The method of producing anesthesia in a mammal in need of anesthesia which comprises administering intravenously to the mammal an anesthetically effective amount of a pharmaceutically acceptable salt of racemic or levo 1,2,3,4,5,6-hexahydro-1-oxo-3-cyclopropylmethyl-8-hydroxy-6(eq),11(ax)-dimethyl-2,6-methano-3-benzazocine.

4,217,355

AMIDE THERAPEUTIC AGENTS

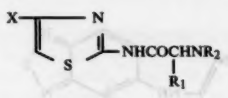
Charles A. Harbert, Waterford, and Joseph G. Lombardino, Niantic, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,065

Int. Cl.[2] C07D *277/38*

U.S. Cl. 424—270 24 Claims

1. A compound of the formula:



II

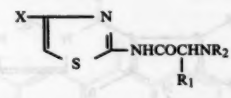
and the pharmaceutically acceptable acid addition salts thereof, wherein

X is a member selected from the group consisting of hydrogen and alkyl having from one to six carbon atoms;

R_1 is a member selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, benzyl and β-phenylethyl; and

R_2 is a member selected from the group consisting of hydrogen, cyclooctyl, cycloalkylmethyl having from five to seven carbon atoms in the cycloalkyl moiety, naphthylmethyl, picolinyl, furfuryl, tetrahydrofurfuryl, thenyl, phenylalkyl and ring-substituted phenylalkyl each having up to three carbon atoms in the alkyl moiety wherein said ring substituent, when divalent, is lower alkylenedioxy directly attached to adjacent positions of the phenyl ring and when monovalent is a member chosen from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, lower alkyl and lower alkoxy; said R_2 being other than hydrogen when said R_1 is hydrogen or alkyl having from one to four carbon atoms.

19. A pharmaceutical composition suitable for alleviating inflamatory conditions and regulating body immune responses comprising a pharmaceutically acceptable carrier and a therapeutically-effective amount of a compound of the formula:



II

and the pharmaceutically acceptable acid addition salts thereof, wherein

X is a member selected from the group consisting of hydrogen and alkyl having from one to six carbon atoms;

R_1 is a member selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms, benzyl and β-phenylethyl; and

R_2 is a member selected from the group consisting of hydrogen, alkyl having from one to six carbon atoms, allyl, methallyl, cyclooctyl, cycloalkylmethyl having from five to seven carbon atoms in the cycloalkyl moiety, naphthylmethyl, picolinyl, furfuryl, tetrahydrofurfuryl, thenyl, phenylalkyl and ring-substituted phenylalkyl each having up to three carbon atoms in the alkyl moiety wherein said ring substituent, when divalent, is methylenedioxy or ethylenedioxy directly attached to adjacent positions of the phenyl ring and when monovalent is a member chosen from the group consisting of fluorine, chlorine, bromine, trifluoromethyl, lower alkyl and lower alkoxy.

4,217,356

2-IMIDAZOLINYLAMINO-2,1,3-BENZOTHIADIAZOLES

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

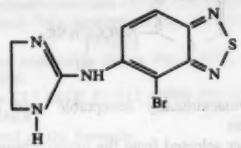
Continuation of Ser. No. 708,798, Jul. 26, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,059

Claims priority, application Switzerland, Aug. 22, 1975, 10911/75

Int. Cl.[2] A61K *31/415;* **C07D** *417/04;* **A61K** *31/425;* **C07D** *417/10*

U.S. Cl. 424—270 **6 Claims**

1. The compound of the formula



or a pharmaceutically acceptable acid addition salt thereof.

2. A pharmaceutical composition useful in treating spastic conditions, for relaxing muscles or in treating rigors comprising a pharmaceutically acceptable carrier or diluent and a therapeutically effective amount of the compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof.

4,217,357

INHIBITION OF THROMBOXANE SYNTHETASE WITH 3-(IMIDAZOL-1-YLALKYL)INDOLES

Peter E. Cross, Canterbury, and Roger P. Dickinson, Dover, both of England, assignors to Pfizer Inc., New York, N.Y.

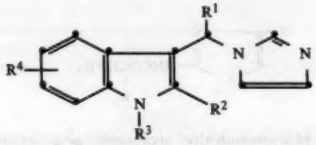
Filed Feb. 22, 1979, Ser. No. 14,217

Claims priority, application United Kingdom, Feb. 24, 1978, 7400/78

Int. Cl.[2] A61K *31/415;* **C07D** *403/06*

U.S. Cl. 424—273 R **30 Claims**

27. A method of inhibiting the action of the thromboxane synthetase enzyme in an animal without significantly inhibiting the action of the prostacyclin synthetase or cyclo-oxygenase enzymes which comprises administering to said animal a thromboxane synthetase enzyme inhibiting amount of a compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

R^1 is hydrogen or lower alkyl;

R^2 is hydrogen, lower alkyl, lower cycloalkyl, adamantyl, or a phenyl or benzyl group in which the phenyl moiety is unsubstituted on the ring or is monosubstituted with halogen, hydroxy, lower alkyl, lower alkoxy or trifluoromethyl;

R^3 is hydrogen, lower alkyl, allyl, 3-methylallyl, lower cycloalkylmethyl, lower cycloalkylethyl, lower alkoxy-lower alkyl, di(lower alkyl) amino-lower alkyl, lower alkanoyl, lower cycloalkyl-carbonyl, or a benzyl or benzoyl group in which the phenyl moiety is unsubstituted on the ring or is monosubstituted with halogen, hydroxy, lower alkyl, lower alkoxy or trifluoromethyl; and

R^4 is hydrogen, lower alkyl, lower alkoxy, halogen hydroxy, trifluoromethyl, di(lower alkyl) amino, or a benzyloxy group in which the phenyl moiety is unsubstituted on the ring or is monosubstituted with halogen, hydroxy, lower alkyl, lower alkoxy or trifluoromethyl.

4,217,358

SUBSTITUTED PHENYLGUANIDINES AND METHOD

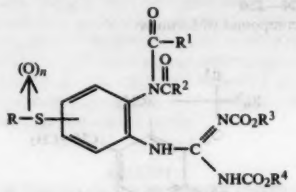
Rudiger D. Haugwitz, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 18, 1979, Ser. No. 31,249

Int. Cl.[2] A61K *31/40, 31/445;* **C07D** *209/48, 207/04*

U.S. Cl. 424—274 **13 Claims**

1. A compound of the structure



wherein R is lower alkyl, cycloalkyl having 3 to 12 carbons, cycloalkyl-lower alkyl having 3 to 12 carbons in the cycloalkyl portion, lower alkenyl, lower alkynyl, phenyl or benzyl, R^1 and R^2 may be the same or different and are lower alkyl of R^1 and R^2 taken together may form an alkylene linking group of 2 or 3 carbons or an o-phenylene group; R^3 and R^4 are the same or different and are lower alkyl, benzyl or phenyl, and n is 0 or 1, and physiologically acceptable salts thereof.

4,217,359

CARBAMATE DERIVATIVES OF MERCAPTOACYL HYDROXY PROLINES

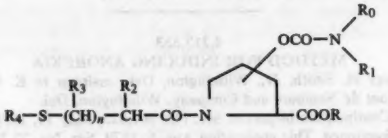
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 3,178, Jan. 15, 1979, abandoned. This application Aug. 13, 1979, Ser. No. 66,119

Int. Cl.[2] C07D *207/12;* **A61K** *31/40;* **C07D** *207/16*

U.S. Cl. 424—274 **19 Claims**

1. A compound of the formula

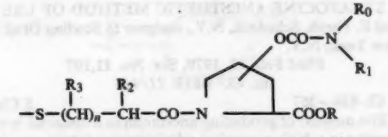


wherein

R, R_2 and R_3 each is hydrogen or lower alkyl;

R_o *and* R_1 each is hydrogen, lower alkyl, allyl, propargyl, cyclo-lower alkyl, phenyl or substituted phenyl, or R_o and R_1 complete a pyrrolidine, piperidine or morpholine ring;

R_4 is hydrogen, a hydrolyzable organic protecting group of the formula R_5CO— or



R_5 is lower alkyl, phenyl, substituted phenyl, phenyl-lower alkyl, substituted phenyl-lower alkyl, cycloalkyl, thienyl, or furyl;

the phenyl substituent in the above groups is halogen, lower

alkyl, lower alkoxy, lower alkylthio or trifluoromethyl; n is 0, 1 or 2;

and pharmaceutically acceptable salts thereof.

18. A composition useful for reducing blood pressure comprising an effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier therefor.

4,217,360

NOVEL 1,3-BENZODIOXANEPROSTANOIC ACID DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Helmut Vorbrüggen; Norbert Schwarz; Olaf Loge, and Walter Elger, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

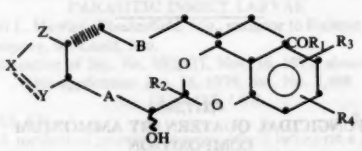
Continuation of Ser. No. 888,059, Mar. 20, 1978, abandoned, which is a continuation of Ser. No. 800,126, May 24, 1977, abandoned, which is a continuation of Ser. No. 659,130, Feb. 18, 1976, abandoned. This application Jan. 10, 1979, Ser. No. 2,268

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1975, 2508826

Int. Cl.[2] C07D *319/08*

U.S. Cl. 424—278 **76 Claims**

1. A 1,3-benzodioxaneprostanoic acid compound of the formula



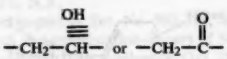
wherein R_1 is (a) hydroxy, (b) alkoxy of 1–10 carbon atoms, (c) methylsulfamido, (d) phenoxy, (e) 1- or 2-naphthoxy, (f) phenoxy or 1- or 2-naphthoxy substituted by 1–3 halogen atoms, phenyl, phenoxy, 1–3 alkyl or alkoxy groups of 1–4 carbon atoms each or one each of chloromethyl, fluoromethyl, trifluoromethyl, carboxy or hydroxy or (g) O—CH_2—U—V, wherein U is a direct bond, carbonyl or carbonyloxy, and V is phenyl or phenyl substituted by one or more of phenyl, phenoxy, alkoxy of 1–2 carbon atoms or halogen;

A is —CH_2—CH_2 or trans—CH=CH—;

B is —CH_2—CH_2— or cis- or trans—CH=CH—;

Z is hydroxymethylene or carbonyl;

X Y, if Z is hydroxymethylene, is



or, if Z is carbonyl, is

or —CH=CH—;

R_2 is hydrogen or alkyl of 1–5 carbon atoms;

R_3 and R_4 each are H, F, Cl, Br, I, CF_3, CH_3, or alkoxy of 1–2 carbon atoms or R_3 and R_4 in 6-, 7-position is methylendioxy; and, when R_1 is hydroxy, salts thereof with pharmaceutically acceptable bases.

4,217,361

DISUBSTITUTED XANTHONE-2-CARBOXYLIC ACID ANTIALLERGY AGENTS

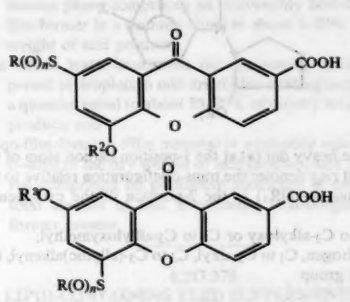
Jurg R. Pfister, Los Altos, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 22, 1978, Ser. No. 908,312

Int. Cl.[2] C07D *311/86*; A61K *31/35*

U.S. Cl. 424—283 **11 Claims**

1. A compound selected from the group represented by

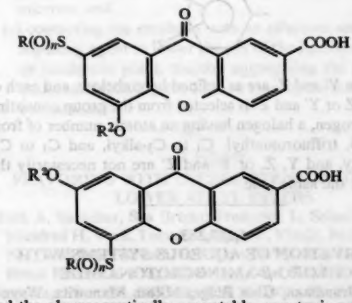


(I)a

(II)a

and the pharmaceutically acceptable, non-toxic esters, amides and salts thereof wherein R is C_1 to C_6 linear or branched alkyl or C_4 to C_6 cyclic alkyl optionallly substituted with C_1 to C_4 linear or branched alkyl, n is the integer 1 or 2 and R^2 is C_2 to C_6 linear or branched hydroxy alkyl or hydroxy-substituted C_4 to C_7 cyclic alkyl optionally substituted with C_1 to C_4 linear or branched alkyl.

10. A method for inhibiting the effects of allergic reactions which comprises administering an effective amount of a compound selected from the group represented by



(I)a

(II)a

and the pharmaceutically acceptable, non-toxic esters, amides and salts thereof wherein R is C_1 to C_6 linear or branched alkyl or C_4 to C_6 cyclic alkyl optionally substituted with C_1 to C_4 linear or branched alkyl, n is the integer 1 or 2 and R^2 is C_2 to C_6 linear or branched hydroxy alkyl or hydroxy-substituted C_4 to C_7 cyclic alkyl optionally substituted with C_1 to C_4 linear or branched alkyl in admixture with a pharmaceutically acceptable, non-toxic carrier.

4,217,362

ANILIDE DERIVATIVES AS ANTIDEPRESSANTS

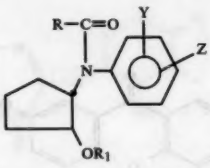
Jacob Szmuszkovicz, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 796,989, May 16, 1977, Pat. No. 4,128,663, which is a continuation-in-part of Ser. No. 777,599, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 746,191, Nov. 30, 1976, abandoned. This application Aug. 3, 1978, Ser. No. 930,690

Int. Cl.[2] A61K *31/24*; C07C *103/38*

U.S. Cl. 424—309 **4 Claims**

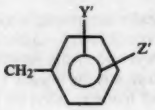
1. A compound of the formula



wherein the heavy dot (•) at the 1-position carbon atom of the cyclopentyl ring denotes the trans-configuration relative to the oxygen group (—OR_1) in the 2-position of the cyclopentyl ring;

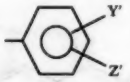
R is C_1 to C_3-alkyloxy or C_1 to C_3-alkyloxymethyl;

R_1 is hydrogen, C_1 to C_3-alkyl, C_3 to C_5-(allyllic)alkenyl, the benzyl group



wherein Y′ and Z′ are as defined above, or the group

wherein R_2 is hydrogen, C_1 to C_3-alkyl, the benzyl group as above, or a phenyl group



wherein Y′ and Z′ are as defined hereinbelow; and each of Y and Z or Y′ and Z′ is selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, C_1 to C_3-alkyl, and C_1 to C_3-alkyloxy, and Y, Z, or Y′ and Z′ are not necessarily the same at the same time.

4,217,363

PRESERVATION OF AQUEOUS SYSTEMS WITH α-CHLORO-β-AMINOCROTONAMIDE

Harold A. Brandman, Glen Ridge; Milton Manowitz, Wayne, and David L. Coffen, Glen Ridge, all of N.J., assignors to Givaudan Corporation, Clifton and Hoffmann-La Roche Inc., Nutley, both of, N.J.

Filed Aug. 17, 1978, Ser. No. 934,308

Int. Cl.[2] A01N *9/20*; C07C *103/133*; D21F *1/66*

U.S. Cl. 424—320 **9 Claims**

1. A method of inhibiting or preventing the growth of bacteria and fungi in an aqueous composition subject to spoilage thereby which comprises incorporating in said composition an effective amount of α-chloro-β-aminocrotonamide.

4,217,364

ANTIMICROBIAL COMPOSITIONS

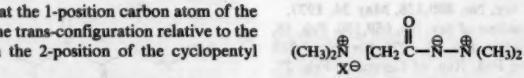
Jon J. Kabara, Okemos, Mich., assignor to Michigan State University, East Lansing, Mich.

Division of Ser. No. 633,036, Nov. 18, 1975. This application Jul. 12, 1979, Ser. No. 57,060

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—320 **1 Claim**

1. A method of inhibiting the growth of bacteria and fungi which comprises applying to said organisms or their loci an antimicrobially effective amount of a compound of the formula



wherein X is chloro, bromo or iodo, and n is an integer of from 10–16.

4,217,365

FUNGICIDAL QUATERNARY AMMONIUM COMPOSITION

Stanislaw Witek, Swobodna Str., 12, Wroclaw; Damian Grobelny, Cieszkowskiego Str., 15, Wroclaw; Janina Ptaszkowska, Ks. Janusza Str., 62, Warszawa; Andrzej Bielecki, R. Luksemburg Str., 25, Opole; Edmund Bakuniak, Dzielna Str., 11a, Warszawa; Stefan Fulde, Traugutta Str., 7/9, Warszawa, and Jadwiga Gorska-Poczopko, Instytucka Str., 4, Jablonna/k Warszawy, all of Poland

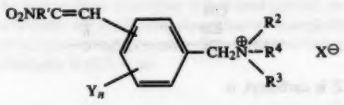
Filed Mar. 9, 1978, Ser. No. 884,842

Claims priority, application Poland, Mar. 11, 1977, 196612

Int. Cl.[2] A01N *9/20*

U.S. Cl. 424—329 **6 Claims**

1. A fungicidal composition containing as the active substance therein a fungicidally effective amount of a compound having the general formula



wherein

R^1 is an alkyl radical containing 1–3 carbon atoms or a hydrogen atom,

x is a halogen atom,

R^2 and R^3 are alkyl or hydroxyalkyl radicals containing 1–4 carbon atoms,

R^4 is an alkyl radical containing 1–18 carbon atoms,

y is a hydroxyl, lower alkoxyl, alkyl or nitro group, and

n is the number of y substituents and equals 0–4, and a mineral or organic carrier.

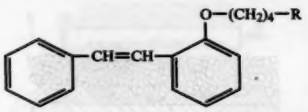
4,217,366

PHARMACEUTICALLY ACTIVE 2-(4-AMINOBUTOXY)STILBENES

Ryoji Kikumoto, Machida; Akihiro Tobe, Kawasaki; Harukazu Fukami, Yokohama; Kunihiro Ninomiya, Yokohama, and Mitsuo Egawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Feb. 14, 1979, Ser. No. 11,998
Claims priority, application Japan, Mar. 9, 1978, 53-26906
Int. Cl.[2] A61K *31/135;* C07C *93/06*
U.S. Cl. 424—330 6 Claims

1. A compound having the formula (I):



wherein R is $-NR_1R_2$ wherein R_1 and R_2, which may be the same or different, are each selected from the group consisting of hydrogen and C_1–C_5 alkyl or an acid addition salt thereof.

5. A method of treating convulsions and seizures or relieving skeletal muscle spasm in warm-blooded animals which comprises administering to said animals an effective amount for treatment of convulsions and seizures or relief of skeletal muscle spasm of a compound of claim 1 or the acid addition salt thereof.

4,217,367

COMPOSITION AND METHOD FOR GROWING PARASITIC INSECT LARVAE

Robert L. Hawley, Chesterfield, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 852,127, Nov. 16, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,498
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—2 7 Claims

1. A method of growing parasitic insect larvae on a growth medium containing a proteinaceous ingredient comprising:

(a) mixing a nutritionally effective amount of a vegetable protein isolate and an animal protein material to provide the proteinaceous ingredient;

(b) adding to said growth medium a slowly ionizable organic acid or acid producing salt thereof to maintain a pH below about 8.5 in the medium during the growth period of the larvae;

(c) feeding the growth medium to the larvae.

4,217,368

LONG-LASTING CHEWING GUM AND METHOD

Frank Witzel, Spring Valley; Donald A. M. Mackay, Pleasantville, both of N.Y.; Abraham I. Bakal, Parsippany, N.J., and K. Warren Clark, Brewster, N.Y., assignors to Life Savers, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 903,310, May 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 814,014, Jul. 8, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,291
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—5 35 Claims

1. A chewing gum having a prolonged sweet taste consisting essentially of a water-soluble phase consisting essentially of softener and a first sweetener in particulate form dispersed throughout the softener, and a relatively water-insoluble phase consisting essentially of a plurality of separate and distinct masses suspended in and dispersed throughout the water-soluble phase, each of said masses comprising gum base and particles of a second sweetener enveloped by said gum base, the water-soluble phase providing initial sweetness impact, while the gum base provides a protective vehicle for the second sweetener to control and slow down release of the second sweetener, thereby providing extended sweetness after the initial sweetness impact has subsided.

4,217,369

MOISTURE RESISTANT NUT-LIKE FOOD COMPOSITION

Jack R. Durst, Champlin, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Aug. 9, 1976, Ser. No. 713,077
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—98 21 Claims

13. An edible moisture-resistant simulated nutmeat composition which comprises:

an edible hydratable film-forming component in dried continuous phase comprising an irreversibly heat-coagulated film-former in a quantity equal to about 5–20% of the dry weight of said product;

an edible water-immiscible oil component uniformly dispersed as droplets in said dried film-forming component in a quantity equal to about 35–70% of the dry weight of said product; and

non-film-forming filler material in a quantity equal to about 0–40% of the dry weight of said product, said filler material comprising no permanent plasticizer in excess of the total amount of said irreversibly heat-coagulable film-former present.

4,217,370

LIPID-CONTAINING FEED SUPPLEMENTS AND FOODSTUFFS

Robert M. Rawlings, and Donald Procter, both of Boise, Id., assignors to Blue Wing Corporation, Boise, Id.

Continuation of Ser. No. 827,572, Aug. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 665,005, Mar. 8, 1976, abandoned. This application Sep. 29, 1978, Ser. No. 947,194
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—98 97 Claims

1. A process for producing nutrient compositions containing microencapsulated lipids in proteinaceous matter consisting of:

(a) contacting particulate protein and water and adjusting the pH thereof to a pH value between about 9 and about 13 by the addition of a protein solubilization agent thereto and admixing the resulting mixture to solubilize said protein in said water;

(b) admixing a lipid material with the solubilized protein so as to form an emulsion wherein said lipid is in the form of globules of sizes in the range of from about 0.5 to about 50 microns; and

(c) contacting the emulsion with an effective amount of pH adjusting agent to lower the pH of the emulsion to at least its isoelectric point, thereby aggregating the protein and microencapsulating the lipid to thereby form said nutrient composition.

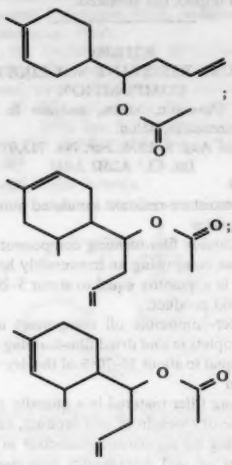
4,217,371

FLAVORING WITH CYCLOHEXENE METHANOL LOWER ALKYL ESTERS

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 7, 1979, Ser. No. 46,363
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—538 4 Claims

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.05 ppm up to about 500 ppm based on said foodstuff of an alpha-allyl-cyclohexene-1-methanol acetate having a structure selected from the group consisting of:



4,217,372

METHOD FOR IMPROVING THE STRUCTURAL PROPERTIES OF FATS

Hermanus J. G. Ebskamp, 7, 2e Industrieweg, Lopik, Netherlands

Continuation of Ser. No. 681,702, Apr. 29, 1976, Pat. No. 4,087,565, which is a continuation of Ser. No. 570,888, Apr. 23, 1975, abandoned, which is a continuation of Ser. No. 353,814, Apr. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 70,997, Sep. 10, 1970, abandoned. This application Feb. 21, 1978, Ser. No. 879,440

Claims priority, application Netherlands, Sep. 11, 1969, 6913846; Feb. 17, 1970, 7002216

Int. Cl.[2] A23D *3/02*

U.S. Cl. 426—603 6 Claims

1. A process for producing margarine, which consists essentially of the steps of:

feeding into a first zone a water-in-oil emulsion wherein the oil phase is a molten fat mixture consisting essentially of

(a) from 40% to 90% by weight of liquid oil containing a high percentage of polyunsaturated fatty acids, said liquid oil being not crystallisable at 10° C., and

(b) the balance is a fat of animal or vegetable origin having a melting point of at least 30° C.,

and in said first zone cooling said emulsion to a first temperature of between 20° C., as a lower limit, and at least 2° C. below the melting point of said fat in said emulsion, as an upper limit, and simultaneously agitating the emulsion in the first zone, whereby to remove from 5 to 70% of the total latent heat of crystallisation of the fat components of the emulsion which crystallise at a temperature of above 10° C.,

then discontinuing cooling of said emulsion after it has reached said first temperature and feeding said emulsion into a second non-cooled zone and therein subjecting said emulsion to mechanical working and agitation, without cooling said emulsion, to cause the temperature of said emulsion to rise at least 0.5° C. and up to a maximum temperature which is at least 0.5° C. below the melting point of said fat in said emulsion,

then after said emulsion has reached said second temperature, feeding said emulsion into a third cooled zone and therein cooling said emulsion to a temperature below 20° C. while continuing to agitate said emulsion.

4,217,373

THERMOGRAPHIC PLATE FOR MEASURING TEMPERATURE DISTRIBUTIONS

Friedrich Jennen, Bergisch-Gladbach, Fed. Rep. of Germany, and Jean Tricoire, Paris, France, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

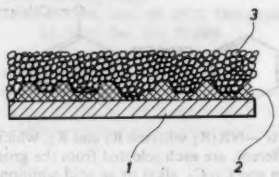
Division of Ser. No. 709,991, Jul. 30, 1976, Pat. No. 4,101,696. This application Dec. 23, 1977, Ser. No. 864,022

Claims priority, application France, Aug. 19, 1975, 2536773

The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.

Int. Cl.[2] G01K *11/16*

U.S. Cl. 427—2 5 Claims



1. A method for producing a thermographic plate with an overall thickness of less than 200 μm comprising: providing a transparent carrier film, spray coating an intermediate latex-based black layer on the film having an average thickness in the range of 4–18 μm by spray coating a plurality of successive spray coats of latex with intermediate drying on the otherwise transparent carrier film, to produce an irregular array of individual black islands to provide a statistically fluctuating transparency and applying a layer of liquid crystals on the intermediate layer.

4,217,374

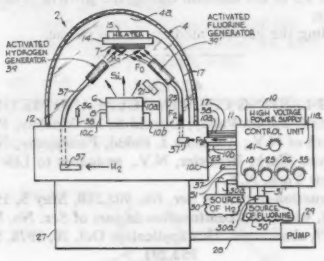
AMORPHOUS SEMICONDUCTORS EQUIVALENT TO CRYSTALLINE SEMICONDUCTORS

Stanford R. Ovshinsky, Bloomfield Hills, and Masatsugu Izu, Birmingham, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 8, 1978, Ser. No. 884,664

Int. Cl.[2] H01L *45/00*

U.S. Cl. 427—39 47 Claims



1. A method of producing an amorphous semiconductor fluid comprising a solid compensated or altered amorphous semiconductor host matrix with electronic configurations which have an energy gap and a low density of localized states therein, said method comprising depositing on a substrate an amorphous semiconductor host matrix film and introducing therein a plurality of different and complimentary compensating or altering materials comprising at least hydrogen and fluorine, each of which reduces localized states in the energy gap not similarly reducible by any amounts used of the other of same, so that the combination of said different and compensat-

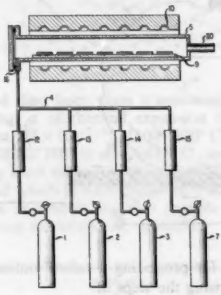
ing or altering materials produces a greater reduction in the density of localized states in the energy gap than any one of the same could achieve.

4,217,375

DEPOSITION OF DOPED SILICON OXIDE FILMS

Arthur C. Adams, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 30, 1977, Ser. No. 829,188
Int. Cl.² H01L *21/18*
U.S. Cl. 427—85 **7 Claims**



1. A process for depositing a doped insulating material comprising the steps of passing a gaseous reaction mixture containing silane and a dopant source over a heated deposition substrate and depositing doped silicon dioxide on said deposition substrate CHARACTERIZED IN THAT said gaseous reaction mixture comprises nitrous oxide, silane and a dopant source, that said deposition substrate is maintained at a temperature in the range from about 800 to 900 degrees C., and that said doped silicon oxide is doped with a phosphorus containing compound to a concentration between about ½ and 6 percent by weight of said silicon oxide by the addition of said dopant source to said reaction mixture.

4,217,376

CAVITY FILLING WITH A HOT MELT ADHESIVE COMPOSITION

Donald D. Donermeyer, Springfield, and Joseph G. Martins, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 4, 1978, Ser. No. 948,452
Int. Cl.² B23P *7/04*
U.S. Cl. 427—142 **21 Claims**

1. A method of filling a cavity in a substrate which comprises applying excess adhesive composition as a hot melt into the cavity, spreading the adhesive composition to fill the cavity, cooling the adhesive composition below its crystallization temperature and sanding the adhesive composition to provide a surface even with the surrounding substrate, wherein the adhesive composition comprises a block copolymer, a particulate mineral reinforcing agent, glass fiber and hollow inorganic silicate microspheres; wherein the block copolymer is selected from the group consisting of copolyesters, copolyamides, copoly(esteramides) and copoly(ether-esters) melting at a temperature of above about 150° C., having from about 30 to about 70 weight percent of hard segments and from about 70 to about 30 weight percent of soft segments; wherein the weight ratio of block copolymer to particulate mineral reinforcing agent, glass fiber and silicate microspheres is in the range of about 3:7 to about 3:2, wherein the weight ratio of block copolymer to glass fiber is at least about 3:4; wherein the weight ratio of particulate mineral reinforcing agent to glass fiber is in the range of about 1:3 to about 9:1 and wherein the volume percentage of silicate microspheres is less than about 12.

4,217,377

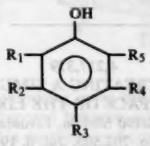
CROSSLINKING AGENT FOR POWDER COATINGS

Greg D. Shay, Country Club Hills, and James H. Griffith, Homewood, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 799,032, May 20, 1977, which is a continuation of Ser. No. 566,859, Apr. 10, 1975, abandoned, which is a division of Ser. No. 427,604, Dec. 26, 1973, Pat. No. 3,904,623. This application Apr. 13, 1979, Ser. No. 29,798
Int. Cl.² C08K *3/22*; C08L *61/34*
U.S. Cl. 427—195 **22 Claims**

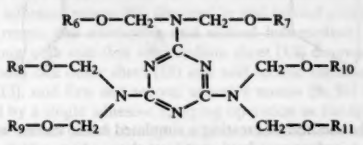
1. A method of forming a polymeric coating on a substrate which comprises applying to the substrate an effective amount of a curable polymeric powder consisting essentially of a polymer containing carboxyl, anhydride, hydroxyl, epoxy or amide functional groups and up to about 35% by weight of said polymer of a low molecular weight crosslinking agent and subsequently curing said polymeric powder onto the substrate at temperatures ranging up to about 400° F.; said crosslinking agent characterized as a low molecular weight, non-gelled, solid addition product having a softening point above 100° F. obtained by reacting

(a) approximately 1.8 to 2.2 moles of at least one monohydroxy aromatic compound having the formula:



wherein the R substituents R_1, R_2, R_3, R_4, and R_5 are either the same or different and are selected from the class consisting of hydrogen, alkyl radicals of 1 to 4 carbon atoms, alkoxy radicals of 1 to 4 carbon radicals and NO_2 radicals provided that at least one of the R substituents is hydrogen and

(b) approximately 1.0 mole of an amino-triazine having the formula:



wherein the R substituents R_6, R_7, R_8, R_9, R_{10} and R_{11} are either the same or different and are alkyl radicals of 1 to 4 carbon atoms.

4,217,378

METHOD OF PRODUCING A DECORATIVE EFFECT ON PLANAR SURFACES AND ARTICLES PRODUCED THEREBY

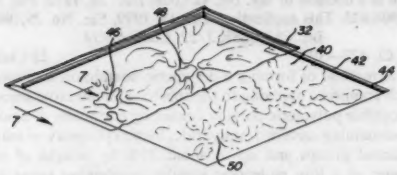
Stephen J. Pizur, Sr., 905 Oak Ave., Barnesboro, Pa. 15714

Filed Jul. 18, 1978, Ser. No. 925,767
Int. Cl.² B05D *3/12, 5/00*
U.S. Cl. 427—259 **8 Claims**

1. A method for producing a decorative patterned coating on a rigid planar material comprising the following steps:

(a) preparing a flexible plastic film locally distorted by application of a substantially smokeless flame beneath the film just long enough and close enough to melt the plastic film slightly without breaking the surface of the film, whereby a distorted wavy irregular surface texture is produced radiating outwardly from point of application of the flame;

(b) applying a liquid coating composition to the rigid planar support material;
(c) placing the distorted wavy irregular surface textured film from step (a) upon the coated surface formed in step (b) without allowing the coating composition to dry;
(d) applying compression means to hold projecting surfaces



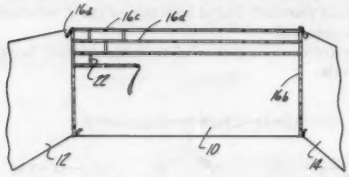
of the film in contact with said rigid planar material thereby causing spreading of the coating and exposure of portions of said planar material;
(e) allowing the coating composition to dry;
(f) removing the compression means; and
(g) removing the film, leaving said decorative patterned coating.

4,217,379

METHOD FOR CREATING A SIMULATED BRICK SURFACE OR THE LIKE

Silvano E. Salvador, 20490 Melvin, Livonia, Mich. 48152

Continuation of Ser. No. 702,503, Jul. 6, 1978, abandoned. This application Feb. 15, 1978, Ser. No. 877,858
Int. Cl.[2] B05D *5/00, 1/32*
U.S. Cl. 427—272 **4 Claims**



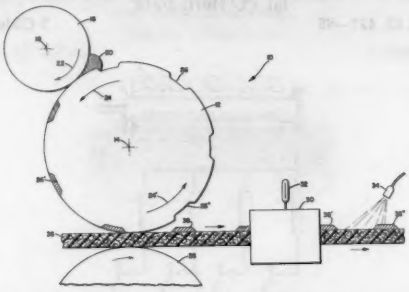
1. The method of creating a simulated brick surface or the like on a surface area having at least three edges, which comprises the steps of adhering along a first edge of the area a first length of adhesive, elongate, flexible tape having a first series of discrete marks spaced at regular intervals thereon in the longitudinal direction thereof, with one of said marks being positioned in preselected relation to a second edge of the area extending generally perpendicular to the first edge; adhering along a third edge of the area parallel with the first edge a second length of adhesive, elongate, flexible tape, having thereon a corresponding first series of discrete marks spaced at the same said regular intervals in the longitudinal direction thereof with one of said marks on the second length of tape being positioned in a preselected relation to the second edge of the area corresponding to the positioning of the said one of the marks on the first length of tape in relation to that second edge of the area; adhering a plurality of lengths of adhesive elongate flexible tape in parallel between corresponding marks on said first and second lengths, wherein corresponding marks on each tape are spaced the same longitudinal distance from the said one mark on each respective tape; and further including the step of applying a plastic settable composition as a coating over the surface area and over the adhered tape.

4,217,380

PROCESS FOR PRODUCING A RAISED EMBOSSED EFFECT

Joseph J. Medica, and William T. Hahn, both of St. Petersburg, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 802,865, Jun. 2, 1977, abandoned. This application Sep. 22, 1978, Ser. No. 945,083
Int. Cl.[2] B05D *5/00, 1/28*
U.S. Cl. 427—287 **36 Claims**



1. A process for producing a raised embossed effect on a substrate comprising the steps of:
I. contacting the substrate with a pattern roll having depressions therein which are filled with a coating composition comprising:
A. a filler,
B. a binder for the filler,
C. water, and
D. montmorillonite which is finely divided in an amount necessary to impart the desired thixotropic properties to the coating composition,
thereby transferring the coating composition in an embossed pattern to the substrate while retaining the shape of the coating composition, and then,
II. removing the water from the coating composition.

4,217,381

LEATHER-LIKE SHEET MATERIAL COMPRISING A URETHANE ELASTOMER PRODUCED FROM POLYDIPROPYLENE ADIPATE AND THE PROCESS OF PRODUCING SAID MATERIAL

Koin Asano, Takatsuki, Japan, assignor to Kanebo Ltd., Tokyo, Japan

Continuation of Ser. No. 425,978, Dec. 19, 1973, abandoned. This application Nov. 20, 1978, Ser. No. 962,184
Claims priority, application Japan, Dec. 28, 1972, 48-1648
Int. Cl.[2] B05D *3/10;* **B32B** *5/24, 27/12, 27/40*
U.S. Cl. 427—340 **12 Claims**

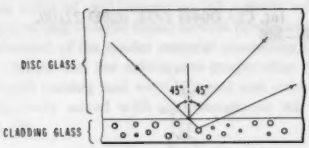
1. A process for producing leather-like sheet material consisting essentially of applying a solution of a polyurethane elastomer produced from (1) a polyol component containing at least 50% by weight of polydipropylene adipate, (2) an organic diisocyanate and (3) a chain extending agent onto a film making plate or a fibrous base material for synthetic leathers, then dipping it in a coagulating liquid so as to be coagulated and then water-washing and drying.

3. A process according to claim **1** wherein water, an aqueous solution of an inorganic salt or a mixed solution of N,N-dimethyl formamide and water is used for said coagulating liquid.

4,217,382
EDGE-CLADDING GLASS OF DISC LASER GLASS

Hisayoshi Toratani, Hidakamachi, Japan, assignor to Hoya Corporation, Tokyo, Japan

Filed Mar. 26, 1979, Ser. No. 23,992
Claims priority, application Japan, Jun. 20, 1978, 53-74575
Int. Cl.[2] B32B *17/06;* C03C *3/16;* H01S *3/17*
U.S. Cl. 428—66 2 Claims



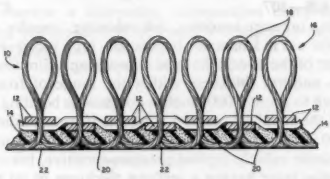
2. An edge-clad disc laser glass comprising a disc glass having a coefficient α of thermal expansion ranging about 145×10^{-7} to about 175×10^{-7}/°C. (100°–200° C.), a transition point Tg ranging about 380° to about 450° C., and a refractive index (nd) ranging from about 1.44 to about 1.48, the circumferential portion of which is surrounded by a medium having reduced reflection and scattering and capable of absorbing laser light, consisting essentially of, in mol%:

P_2O_5	46–63,
Al_2O_3	4–8,
B_2O_3	0–5,
K_2O	2–20,
Na_2O	1–15,
Li_2O	0–14,
$K_2O + Na_2O + Li_2O$	18–30,
CuO	2–20,
ZnO	0–15,
MgO	0–5, and
CuO + ZnO + MgO	7–20.

4,217,383
FOAM COATED CARPET PRIMARY BACKING MATERIAL

Henry G. Patterson; Stanley A. Shemchek, both of Dalton; Robert G. Doone, Summerville, and Henry B. Christopher, Dalton, all of Ga., assignors to Textile Rubber & Chemical Company, Inc., Dalton, Ga. and Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 861,990, Dec. 19, 1977, abandoned. This application Jan. 9, 1979, Ser. No. 2,204
Int. Cl.[2] B32B *33/00*
U.S. Cl. 428—95 4 Claims

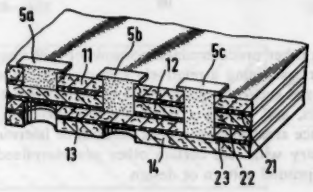


1. Tufted carpet product comprising a primary carpet backing material having an undersurface and an upper surface; a layer of dried tuftable foam compound adhered to the undersurface of the carpet backing material, and loops of carpet yarn extending through the foam compound and the backing material to produce a face yarn on the upper surface of the primary backing and loop backs of yarn on the layer of foam compound, such that the foam compound inwardly of the loop backing is compressed, the foam compound adjacent the loop backs is uncompressed and the exposed surface of the loop backs is at substantially the same level as the uncompressed foam compound adjacent the loop backs so that the undersurface of said carpet product is substantially flat having only slight indentations in said foam compound adjacent each loop back.

4,217,384
MULTIPLE SETS, PARTICULARLY ENDLESS SETS

Lieselotte Schnug, Sachsen ueber Ansbach, Fed. Rep. of Germany, assignor to EDV-Druck Walter Schnug KG, Sachsen ueber Ansbach, Fed. Rep. of Germany

Filed Oct. 19, 1977, Ser. No. 843,619
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648124; Mar. 2, 1977, 2708910; May 17, 1977, 2722240
Int. Cl.[2] B32B *3/10;* B41M *5/10, 5/22*
U.S. Cl. 428—138 7 Claims



1. A multiple set comprising outer sheets and a plurality of intermediate sheets disposed between said outer sheets, said sheets being arranged in superimposed array, said intermediate sheets and at least one (**11**) of said outer sheets having at least one first communicating recess, said first communicating recess terminating at but not passing through said other outer sheet (**14**), first adhesive means (**5***c*) disposed in said first communicating recess and contacting the other outer sheet (**14**), at least one second communicating recess in said one outer sheet (**11**) and in at least one first intermediate sheet (**12**), a second communicating recess terminating at but not passing through a second intermediate sheet (**13**) which is disposed further from said one outer sheet (**11**) than said first intermediate sheet (**12**), second adhesive means (**5***b*) disposed in said second communicating recess and contacting said second intermediate sheet (**13**) along with said first intermediate sheet (**12**) disposed between said one outer sheet (**11**) and said second intermediate sheet (**13**), said first and second adhesive means (**5***c*,**5***b*) being applied by a single adhesive applying operation as the applied adhesive means passes through said first and second communicating recesses.

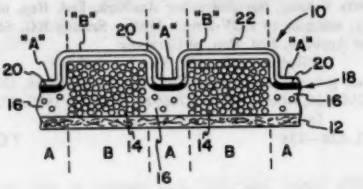
4,217,385
RESINOUS POLYMER SHEET MATERIALS HAVING SELECTIVE, SURFACE DECORATIVE EFFECTS AND METHODS OF MAKING THE SAME

Harry A. Shortway, Franklin Lakes; Alan A. Graham, Mercerville, and Charles H. Miller, Lawrenceville, all of N.J., assignors to Congoleum Corporation, Kearny, N.J.

Continuation-in-part of Ser. No. 879,171, Feb. 21, 1978, abandoned, which is a continuation of Ser. No. 942,246, Sep. 14, 1978, abandoned. This application Jan. 22, 1979, Ser. No. 5,632
Int. Cl.[2] B32B *5/20, 31/22, 31/26*
U.S. Cl. 428—159 22 Claims

1. A resinous polymer decorative sheet material comprising:
a base layer or substrate;
a printing ink composition printed on said base layer or substrate in a pattern or design in which certain predetermined areas differ from and constrast with certain other predetermined areas; and
a resinous wear layer positioned on and adhered to said printed pattern or design,

certain predetermined portions of said resinous wear layer containing a relatively high concentration of polymerized and/or cross-linked reactive polymerizable monomers, and having a relatively high melt viscosity and mechanically embossed surface areas having a flat, dead or dull texture in registry with said certain predetermined areas of said printed pattern or design, and



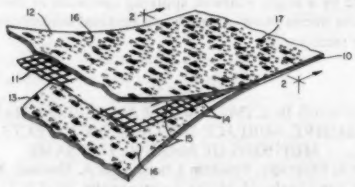
certain other predetermined portions of said resinous wear layer containing a relatively low concentration of polymerized and/or cross-linked reactive polymerizable monomers, and having a relatively low melt viscosity and surface areas having a sleek, smooth or lustrous finish in registry with said certain other predetermined areas of said printed pattern or design.

4,217,386

LAMINATED, HIGHLY SORBENT, ACTIVE CARBON FABRIC

Gilbert N. Arons, Newton Highlands, and Richard N. Macnair, Cambridge, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 7, 1979, Ser. No. 46,733
Int. Cl.[2] B32B *7/08*
U.S. Cl. 428—198 **10 Claims**



1. A laminated, highly sorbent, active carbon fabric, comprising in combination

(a) a middle layer consisting of flexible fabric constructed of fibrous active carbon material, said fibrous active carbon material having a surface area of at least 300 m^2/g; and

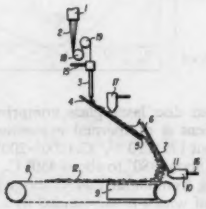
(b) a pair of laminated layers of reinforcing material for reinforcing said middle layer, one of said pair of laminated layers being positioned on each side of said middle layer, each of said laminated layers being constructed of a spunbonded, non-woven fabric layer made from polypropylene and a highly water resistant, melt-blown, fibrous layer made from polypropylene, said laminated layers being spot-welded to said middle layer at spaced apart points.

4,217,387

PROCESS FOR THE MANUFACTURE OF A NON-WOVEN WEB FROM SYNTHETIC FILAMENTS

Dirk J. Vlezee, Westervoort; Petrus J. M. Mekkelholt, Rheden, and Johannes A. Juijn, Ce Velp, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Sep. 25, 1978, Ser. No. 945,394
Claims priority, application Netherlands, Sep. 26, 1977, 7710470
Int. Cl.[2] D04H *1/58;* B29D *27/00*
U.S. Cl. 428—288 **6 Claims**



1. A process for the manufacture of a non-woven web having a high degree of isotropy from synthetic filaments, comprising directing one or more bundles of said filaments emerging from one or more spinning orifices onto a stationary filament spreading plate by means of a latterally positioned air jet, said spreading plate being positioned at an angle to said air jet, advancing the resulting streams of spread filaments and air along said spreading plate, deflecting said stream of spread filaments and air downwardly at an angle of about 10°–60° from said spreading plate towards an advancing supporting device through a slit formed between the lower end of said stationary spreading plate and a stationary deflector plate, whereby said stream of air is slowed down, directing an air jet transversely to said deflected stream of filaments and parallel to the surface of said supporting device, depositing said stream of filaments in criss-cross configuration onto said advancing support device to form a web and bonding individual filaments to each other.

4,217,388

PRESSURE-SENSITIVE TRANSFER ELEMENTS AND PROCESS

Michael A. Scott, Huntington; Albert E. Brown, Glen Cove, and Edward Young, Manhasset, all of N.Y., assignors to Columbia Ribbon and Carbon Mfg. Co., Inc., Plainview, N.Y.

Filed Mar. 27, 1978, Ser. No. 889,661
Int. Cl.[2] B32B *3/26, 5/18*
U.S. Cl. 428—307 **17 Claims**

1. Thin, pressure-sensitive, ink-releasing transfer element adapted for use in a hammer-impression, high speed electronic typewriter of the overstrike type comprising a film foundation having a uniform thickness within the range of from about 0.0001 inch to about 0.0005 inch, a continuous bonding layer of synthetic thermoplastic resin having a uniform thickness of up to about 0.0001 inch present on one surface of said foundation, and a volatile vehicle-applied pressure-sensitive, ink-releasing microporous layer having a uniform thickness of up to about 0.0008 inch present on said continuous bonding layer, said microporous layer comprising a non-transferable porous network of vinyl chloride-vinyl acetate copolymer binder material containing within the pores thereof a pressure-exudable thixotropic, substantially-solid ink comprising a semi-solid oleaginous ink vehicle which is substantially incompatible with said resin binder material, a wetting agent having both hydrophilic and oleophilic groups and a quantity of coloring matter comprising a hydrophilic pigment, said semi-solid ink being a thick paste having low cohesive strength and a viscosity between about 100,000 and 1,000,000 centipoises at ordinary

room temperatures, said volatile vehicle comprising a miscible mixture of (a) a volatile liquid solvent which is a solvent for said binder material and for said oleaginous ink vehicle but is a non-solvent for said wetting agent, and (b) a less volatile liquid which is a solvent for said oleaginous ink vehicle and for said wetting agent but is a non-solvent for said binder material and which has a boiling point at least about 30° F. higher than the boiling point of said volatile liquid solvent but which is below the boiling point of said oleaginous ink vehicle whereby the evaporation of said volatile liquid solvent produces said microporous structure of the binder material containing said oleaginous ink vehicle and the subsequent evaporation of said less volatile liquid causing said wetting agent and coloring matter to be selectively mixed with said oleaginous ink vehicle to form said ink.

4,217,389

CURABLE MIXTURE OF WATER SOLUBLE POLYESTER AND POLYIMIDE PRECURSOR, PROCESS OF COATING AND PRODUCTS

Marvin A. Peterson, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 501,932, Aug. 30, 1974, Pat. No. 4,004,062, which is a continuation-in-part of Ser. No. 475,483, Jun. 3, 1974, Pat. No. 4,003,947, which is a continuation-in-part of Ser. No. 467,615, May 6, 1974, Pat. No. 4,073,788, which is a continuation of Ser. No. 822,899, May 8, 1969, abandoned. This application Sep. 24, 1976, Ser. No. 726,248

The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.

Int. Cl.[2] **C08L** *67/00, 79/08*

U.S. Cl. 428—383 **38 Claims**

1. A water soluble coating composition comprising:

(a) a water soluble, film forming, polyimide precursor; and

(b) a water soluble, film forming, polyester; a coating of said composition on a substrate being curable to form a cured resin coating.

4,217,390

FIBER LUBRICANTS DERIVED FROM THE OXYALKYLATION OF A GLYCEROL-1,3-DIALKYLETHER

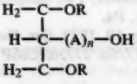
David D. Newkirk, and Robert B. Login, both of Woodhaven, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 30, 1978, Ser. No. 956,052

Int. Cl.[2] **D06M** *3/30;* **C10M** *1/06, 1/20;* **B32B** *27/02*

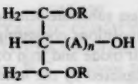
U.S. Cl. 428—395 **10 Claims**

1. A lubricated, thermoplastic, synthetic fiber having incorporated thereon a lubricating composition comprising the lubricating composition comprising a compound having the structural formula:



wherein R is an aliphatic radical having about 3 to about 22 carbon atoms; A is a mixture of the residues of ethylene oxide and at least one other lower alkylene oxide; n has a value to produce a molecular weight of about 300 to about 3000; and said compound is derived by oxyalkylating the reaction product of an epihalohydrin and a fatty alcohol.

7. The process of lubricating thermoplastic synthetic fibers comprising the application to said fibers utilizing aqueous dispersions, emulsions or solutions of a lubricating composition comprising a compound having the structural formula:



wherein R is an aliphatic radical having about 3 to about 22 carbon atoms; A is a mixture of the residues of ethylene oxide and at least one other lower alkylene oxide; n has a value to produce a molecular weight of about 300 to about 3000; and said compound is derived by oxyalkylating the reaction product of an epihalohydrin and a fatty alcohol.

4,217,391

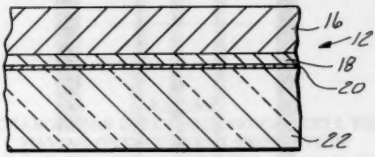
GLASS PANEL FOR LAND VEHICLES

Milton C. Kaltz, 10809 Balfour, Allen Park, Mich. 48101

Filed Dec. 26, 1978, Ser. No. 973,746

Int. Cl.[2] **B60J** *7/04;* **B32B** *17/06*

U.S. Cl. 428—428 **12 Claims**



1. A translucent laminated glass panel for a land vehicle comprising:

(a) a photometric glass sheet

(b) a heat absorbing glass sheet, the photometric and heat absorbing sheets cooperating to reduce glare and absorb heat generated by the sun,

(c) a transparent vinyl fabric adhered to the photometric glass sheet, and

(d) a reflective coating deposited onto the heat absorbing glass panel immediately below the fabric.

9. In a translucent viewing glass panel of the type adapted to be disposed in an opening formed in the roof of a vehicle and for viewing therethrough, the improvement which comprises:

(a) a photometric gass sheet,

(b) a heat absorbing glass sheet laminated to the photometric sheet, and wherein the photometric and heat absorbing sheet cooperate to define the glass panel and to reduce glare and absorb heat generated by the sun.

4,217,392

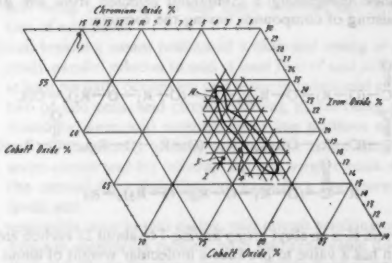
COATED GLASS ARTICLE

Sandy T. S. Vong, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 18, 1979, Ser. No. 49,716

Int. Cl.[2] **B32B** *17/06*

U.S. Cl. 428—432 **3 Claims**



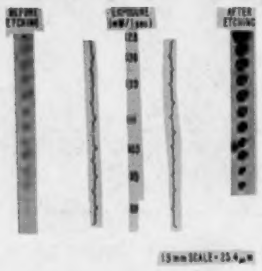
1. As a new article of manufacture: a glass substrate; and

a coatiing on said glass substrate selected from the group of glass coating compositions consisting essentially of chromium oxide, cobalt oxide and iron oxide lying within the enclosed area designated by the letter "A" in FIG. 1.

4,217,393
METHOD OF INDUCING DIFFERENTIAL ETCH RATES IN GLOW DISCHARGE PRODUCED AMORPHOUS SILICON

David L. Staebler, and Peter J. Zanzucchi, both of Lawrenceville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,627
Int. Cl.[2] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 428—450 **15 Claims**



1. A method of forming a surface relief pattern in amorphous silicon comprising:

(a) exposing a portion of an amorphous silicon film, fabricated on a substrate by a glow discharge, to a heat source capable of heating said portion of amorphous silicon to a temperature of about 365° C. above the deposition temperature of said portion of amorphous silicon but less than the temperature at which said heat source introduces crystallinity into said heated amorphous silicon; and

(b) etching away the unexposed amorphous silicon of step (a).

15. An etch resistant amorphous silicon film fabricated in accordance with the method of claim 1.

4,217,394
METAL MOLDS COATED WITH OXIDATIVE STABLE POLYOXYALKYLENE RELEASE AGENTS

David D. Newkirk; Robert B. Login, both of Woodhaven, and Basil Thir, Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 26, 1978, Ser. No. 973,100
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—457 **12 Claims**

1. The process of lubricating the surface of a metal mold comprising coating said surface with a polyoxyalkylene composition comprising a compound selected from the group consisting of compounds having the formula:

$$R-\overset{O}{\overset{\|}{C}}-(O-R_1-O-R_2)_m-R_3-(O-R_1-O-R_2)_n-OH, \quad (I)$$

$$R-\overset{O}{\overset{\|}{C}}-(O-R_1-OR_2)_m-R_3-(O-R_1-O-R_2)_n-\overset{O}{\overset{\|}{C}}-R \text{ and} \quad (II)$$

$$R-\overset{O}{\overset{\|}{C}}-(O-R_1-O-R_2-O-R_5)_n-R_4 \quad (III)$$

wherein R is an alkyl group having 1 to about 21 carbon atoms, m+n has a value to produce a molecular weight of about 300 to about 6000, R_1 and R_2 in the formulas (I) and (III) are the residues of the same or different and in formula (II) different alkylene units derived from alkylene oxides individually selected from the group consisting of ethylene oxide, propylene oxide, butylene oxide and an aromatic glycidyl ether, R_3 is the residue of a difunctional phenol, R_5 is the residue of an aromatic glycidyl ether, R_4 is hydrogen, an alkyl group derived from an aliphatic mono-functional alcohol having 1 to about 21 carbon atoms or an acyl group derived from an aliphatic monocarboxylic acid having about 2 to about 21 carbon atoms and n has a value to produce a molecular weight of about 300 to about 6000.

4,217,395
METHOD OF COATING RUBBER WITH A COMPOSITION WHICH RESISTS REMOVAL BY WATER

Tiong Ho Kuan, Stow, and John G. Sommer, Hudson, both of Ohio, assignors to The General Tile & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 931,597, Aug. 7, 1978, abandoned. This application Mar. 19, 1979, Ser. No. 21,380
Int. Cl.[2] B32B *25/08, 25/12*
U.S. Cl. 428—494 **11 Claims**

1. The method which comprises coating a hot, sticky rubber compound with a heat sensitized aqueous polymer lates composition, drying said coated rubber compound until at least 80% of the water has evaporated to form a gelled, non-tacky, water resistant and adherent polymeric coating from said latex on said rubber compound, cooling said coated rubber compound with water and drying the same to a temperature sufficiently low to prevent scorch of said rubber compound and stacking said coated rubber compound to provide layers of said rubber compound which do not stick together, the polymer of said latex being a carboxylated copolymer of (1) at least 45% by weight of a monomer selected from the group consisting of styrene, vinyl toluene, acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, methyl methacrylate, and ethyl methacrylate and mixtures thereof, (2) of a copolymerizable monomer selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid, maleic acid, fumaric acid, itaconic acid, citraconic acid, sorbic acid and crotonic acid and mixtures thereof, in an amount up to 10% by weight, and (3) the balance, in an amount sufficient to provide some flexibility to and for vulcanization of said copolymer, a copolymerizable monomer selected from the group consisting of butadiene-1,3, isoprene, 2,3-dimethylbutadiene-1,3 and piperylene and mixtures thereof, said copolymer having a glass transition temperature of not less than about −30° C.

6. The product produced by the method of claim 1.

4,217,396
ACRYLATE-ACETOACETATE POLYMERS USEFUL AS PROTECTIVE AGENTS FOR FLOOR COVERINGS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 10, 1979, Ser. No. 38,010
Int. Cl.[2] B32B *27/08, 27/30;* C08F *20/20, 265/04*
U.S. Cl. 428—500 **18 Claims**

1. A cross-linked acrylate-acetoacetate polymer produced by the reaction of at least one polyfunctional acrylate with at least one diacetoacetate in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate and the diacetoacetate.

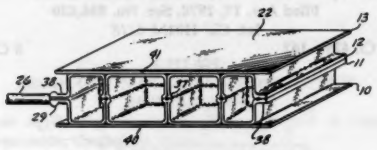
10. A thermoplastic floor covering coated with a wear layer composition comprising a cross-linked acrylate-acetoacetate polymer produced by the reaction of at least one polyfunctional acrylate with at least one diacetoacetate in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate and the diacetoacetate.

4,217,397

METALLIC SANDWICH STRUCTURE AND METHOD OF FABRICATION

Masashi Hayase, Fountain Valley; Richard C. Ecklund, Lakewood; Robert J. Walkington, Garden Grove; James B. Hughes, Long Beach, and Neil R. Williams, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 18, 1978, Ser. No. 898,197
Int. Cl.[2] B23K *31/02*
U.S. Cl. 428—594 14 Claims



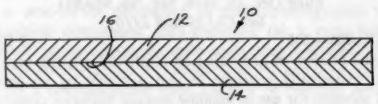
1. A fabricated metal structure comprising:
a first sheet with first and second side surfaces;
a second sheet with first and second side surfaces oriented with respect to said first sheet so that at least a portion of the first side surface of said second sheet is in spaced facing relationship to at least a portion of said second side surface of said first sheet; and
a plurality of rows of intermittent welds connecting laterally deformed portions of said second side surface of said first sheet to portions of said first side surface of said second sheet to define a single web between said first and second sheets at each of said weld rows and wherein said web is formed by fusing said portions of said second side surface of said first sheet immediately adjacent either side of said weld row thereby enveloping the portion of said welds on said first side surface of said second sheet.

4,217,398

THERMOSTAT METAL

Henry Ty, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 10, 1978, Ser. No. 949,483
Int. Cl.[2] B32B *15/04, 15/18*
U.S. Cl. 428—616 3 Claims



1. A two-layer thermostat metal having two layers of metal of such selected relative thickness that the thermostat metal is adapted to display a substantially linear flexivity greater than about 130×10^{-7} inches per inch per degree Fahrenheit in all parts of the temperature range from 0° F. to about 800° F., said thermostat metal consisting only of a first layer of metal of relatively high coefficient of thermal expansion having a nominal composition by weight of from 71 to 76 percent manganese, from 9 to 19 percent copper, and from 9 to 17 percent nickel metallurgically bonded to a second layer of metal or relatively lower coefficient of thermal expansion selected from the group consisting of the stainless steel alloys having compositions by weight as set forth in Table I.

4,217,399

SINTERED BI-METALLIC CONJUGATE FILAMENTS AND THEIR PREPARATION

Emerick J. Dobo, Cary, N.C., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 629,184, Nov. 5, 1975, Pat. No. 4,089,921.
This application Feb. 13, 1978, Ser. No. 876,975
Int. Cl.[2] D02G *3/00*
U.S. Cl. 428—679 4 Claims

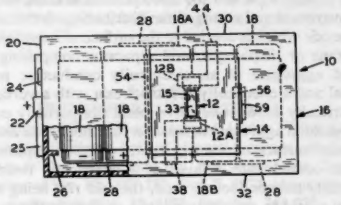
1. A sintered bi-metallic conjugate filament which is comprised of a first longitudinally extending layer along its length comprising a first metal and an adhering second essentially distinct longitudinally extending layer along its length comprising a second metal, wherein each of said first and second metals has the capability of being sintered at a temperature which is below the melting temperature of the other metal and both of said first and second metals have been sintered in said adhering layers after assembly in a conjugate filament form.

4,217,400

RECHARGEABLE ELECTROCHEMICAL CELL PACK HAVING OVERCURRENT PROTECTION

Edward A. Leffingwell, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Aug. 3, 1978, Ser. No. 930,727
Int. Cl.[2] H01M *14/00*
U.S. Cl. 429—7 11 Claims



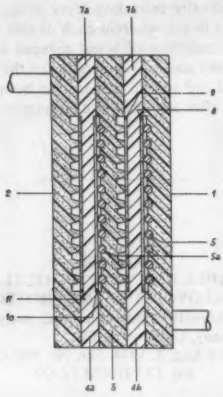
1. A rechargeable electrochemical cell pack comprising:
a casing having positive and negative terminals at the exterior thereof for connection to an external circuit;
a plurality of rechargeable electrochemical cells housed in said casing, at least two of said cells defining a space between said at least two of said cells;
means at the interior of the casing for interconnecting said cells in a series circuit between said casing terminals, said series circuit including a pair of electrically isolated contacts, each of said electrically isolated contacts having a terminal receiving portion, said terminal receiving portion being positioned in said space between said at least two of said cells;
circuit breaking means positioned within said casing in generally parallel relation to said at least two of said cells and at least partially occupying said space between said at least two of said cells, said circuit breaking means being positioned between said terminal receiving portions of said pair of electrically isolated contacts for completing said series circuit and for interrupting said series circuit when the current flow therethrough exceeds a predetermined level; and
a removable door in said casing, said circuit breaking means being in registering relation with said removable door so that said circuit breaking means is firmly held in position in said casing when said removable door is in place.

4,217,401

BIPOLAR SEPARATOR FOR ELECTROCHEMICAL CELLS AND METHOD OF PREPARATION THEREOF

Alberto Pellegri, Luino, Italy, and Placido M. Spaziante, Lugano, Switzerland, assignors to Oronzio de Nora Impianti Elettrochimici S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 951,984, Oct. 16, 1978, abandoned. This application Jun. 15, 1979, Ser. No. 48,994
Claims priority, application Italy, Jul. 10, 1978, 25.510 A/78
Int. Cl.[2] H01M *2/14*
U.S. Cl. 429—39 **15 Claims**



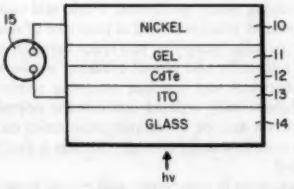
1. A bipolar separator for electrochemical cells, said separator constructed and arranged for distributing electrical current to an anode which is bonded to the surface of a semi-permeable membrane or diaphragm, said separator comprising a rigid, molded aggregate of an electrically conductive powdered material and a chemically resistant resin with a vertical array of electrically conductive valve metal ribs partially embedded in the molded aggregate at least on the anode side and having the entire surface of the aggregate which is exposed to the anolyte, coated with a layer of a chemically resistant and electrically nonconductive resin, the said ribs being arranged to form a grid to distribute electric current to the anode at a uniformly distributed multiplicity of points over the entire anode surface.

4,217,402

PHOTOELECTROCHEMICAL CELLS HAVING GELLED ELECTROLYTE

Robert L. Rod, Marina del Rey; Walter J. Penick, Culver City, and Rodney J. Dobson, Redondo Beach, all of Calif., assignors to Monosolar Inc., Santa Monica, Calif.

Filed Feb. 5, 1979, Ser. No. 9,257
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 **7 Claims**



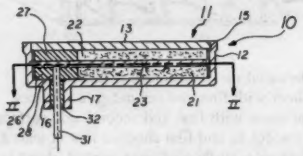
1. A photoelectrochemical cell comprising:
(a). a first electrode of cadmium telluride;
(b) a second electrode of electrically conductive material; and
(c) a gel disposed between said electrodes, said gel comprising an alkaline aqueous electrolyte and silicon dioxide acting as a gelled electrolyte.

4,217,403

LITHIUM HALIDE BATTERY

Matthew O'Boyle, Cockeysville; Alan A. Schneider, Reisterstown, and Ross E. Magladry, Baltimore, all of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed Apr. 17, 1978, Ser. No. 896,639
Int. Cl.[2] H01M *6/18*
U.S. Cl. 429—162 **6 Claims**



1. A lithium battery comprising:
a. an outer encasement member having a base portion and a top portion adapted to assert pressure on a depolarizer pellet and anode, said encasement member having at least one opening therethrough;
b. at least one depolarizer pellet positioned within and in electrical contact with the encasement member;
c. a lithium anode in pressure contact with the depolarizer pellet and electrically spaced apart from the encasement member;
d. at least one insulator means in contact with at least a portion of the anode and having an opening therethrough aligned with the opening in the encasement member; and
e. a terminal pin positioned through said opening in the encasement member and electrically isolated therefrom and in electrical contact with the anode through said opening in the insulator means.

4,217,404

POLYPROPYLENE SEPARATOR FOR USE IN ALKALINE STORAGE BATTERIES AND PROCESS FOR MAKING SAME

Scott A. Verzwyvelt, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 23, 1978, Ser. No. 953,511
Int. Cl.[2] H01M *2/16*
U.S. Cl. 429—206 **9 Claims**

1. The process of providing an improved organic separator that is chemically resistant to and wettable by an aqueous KOH solution for use in alkaline storage batteries comprising the steps of:
a. providing an uncontaminated fabric comprised of fibers selected from the group consisting of polyethylene, polypropylene, and polybutylene, suitable for use as a separator;
b. forming a coating solution by dissolving a polymer selected from the group consisting of polybenzimidazole, polybenzoxazole, and polybenzothiazole in a selected polar solvent;
c. immersing said fabric in said solution and allowing said fabric to soak in said solution until saturated while maintaining a constant polymer-solvent concentration;
d. sequentially removing said saturated fabric from said soaking solution and removing any excess soaking solution from said fabric thereby leaving said fabric impreg-

nated and coated with the solvent and polymer of said soaking solution;

e. causing said solvent to be removed from said coating solution by subjecting said fabric to a solvent removal technique selected from the group consisting of solvent evaporation and solvent precipitation; and

f. drying said coated fabric at an elevated temperature prior to use as a battery separator.

4,217,405

PRODUCTION OF VOLUME DIELECTRIC HOLOGRAMS

Stephen A. Benton, Somerville, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 14, 1975, Ser. No. 622,440
Int. Cl.[2] G03C 5/04, 5/32, 5/38
U.S. Cl. 430—2 7 Claims

1. The method of forming a volume dielectric hologram which comprises developing exposed silver halide grains of holographically exposed silver halide emulsion layer to form therein an imagewise distribution of silver grains, dissolving unexposed silver halide with a silver halide solvent to form a diffusible silver complex, diffusing said diffusible silver complex within said silver halide emulsion layer and precipitating the silver thereof on said silver grains in the presence of a reducing species, and rehalogenating the resulting distribution of silver grains, the resulting hologram having substantially the same average silver halide content per unit area as said exposed but undeveloped silver halide emulsion.

4,217,406

CROSS-LINKING REACTION DURING MELT KNEADING PRODUCES RESINOUS ELECTROPHOTOGRAPHIC TONER

Koichi Tanaka; Kenji Kobayashi, and Shigeo Aonuma, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co. Ltd., Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,594
Claims priority, application Japan, Jul. 29, 1977, 52/90410
Int. Cl.[2] G03G 9/14
U.S. Cl. 430—137 19 Claims

1. A process for producing an electrophotographic toner composition comprising melt-kneading (a) a cross-linkable functional group-containing resin containing functional groups in a proportion of about 5 to about 50 mol% and (b) a colorant, with (c) a polyfunctional resin capable of reacting with the cross-linkable functional group-containing resin (a) or a low molecular weight cross-linking agent capable of cross-linking the cross-linkable functional group-containing resin (a), the amount of the polyfunctional resin or the low molecular weight cross-linking agent (c) being such that the amount of the functional groups present in the polyfunctional resin or the low molecular weight cross-linking agent (c) being equivalent to or less than equivalent to the amount of the functional groups present in the cross-linkable functional group-containing resin (a); cross-linking by heating and generating a shearing force during melt-kneading to produce a slightly cross-linked colored resin such that the adhesion properties and the grindability of the slightly cross-linked colored resin are not deteriorated, and pulverizing the slightly cross-linked colored resin to produce the electrophotographic toner composition.

4,217,407

LIGHT-SENSITIVE O-QUINONE DIAZIDE CONTAINING COPYING MATERIAL

Masaru Watanabe; Tadao Yoyama, and Azusa Ohashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 474,465, May 29, 1974, abandoned.
This application Dec. 1, 1976, Ser. No. 746,555
Claims priority, application Japan, May 29, 1973, 48-60074
Int. Cl.[2] G03C 1/60, 1/76
U.S. Cl. 430—166 9 Claims

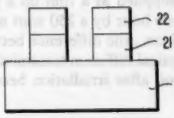
1. A light-sensitive material comprising a support having in order thereon a light-sensitive layer containing 20 to 100% by weight of an o-quinone diazide compound, the solubility of said compound being increased in alkaline solution upon irradiation with active light rays, said light-sensitive layer being coated directly on said support, and a non-light sensitive organic coating layer, said organic coating layer comprising a water-insoluble but organic solvent soluble high molecular weight compound, selected from the group consisting of styrene/maleic anhydride copolymer, styrene/acrylic acid copolymer, polyvinyl butyral, shellac and polyamide resin, having film forming properties, said organic coating layer being water insoluble and barely soluble in alkaline solution, but permeable to alkaline solution, the exposed portion of said light-sensitive layer being completely removed by alkaline solution development along with superimposed corresponding co-extensive exposed portion of the organic coating layer by the alkaline developer, which comprises an aqueous solution of an inorganic alkali or a basic solvent, the concentration of said developer in said developer's solution being from 1 to 20%, permeating the organic coating layer and dissolving the exposed portion of the light-sensitive layer, thereby forming an image of unexposed light-sensitive layer superimposed by corresponding coextensive unexposed portion of organic coating layer, the thickness of each of said layers being from about 0.01 g/m^2 to 0.7 g/m^2.

4,217,408

PRINTING PLATE MATERIAL

Kikuo Kubotera; Eiichi Mizuki, both of Asaka; Hideo Kawano, and Tadahiro Fujiwara, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 187,259, Oct. 7, 1971, abandoned. This application Nov. 22, 1976, Ser. No. 744,076
Claims priority, application Japan, Oct. 7, 1970, 45-88136
Int. Cl.[2] G03C 1/78; G03F 7/06
U.S. Cl. 430—205 28 Claims



1. A printing plate material comprising (1) a support having an oleophilic surface, (2) an intermediate layer and (3) a hydrophilic diffusion transfer image-receiving layer containing nucleus substance for the physical development wherein the improvement comprises (A) that said intermediate layer consists essentially of gelatin, nitrocellulose or mixtures thereof, (B) that said intermediate layer adheres strongly to said oleophilic surface of said support and said hydrophilic diffusion transfer image-receiving layer, (C) that said intermediate layer is formed by coating a liquid consisting essentially of an organic solvent and gelatin, nitrocellulose or admixtures thereof on said oleophilic surface of said support and being removed said organic solvent, and (D) that the portion of said intermediate layer corresponding to the silver image formed on said hydrophilic diffusion transfer image-receiving layer by silver complex diffusion transfer development is etched in the etch-

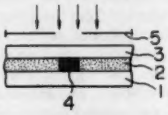
ing bleach treatment simultaneously together with said silver image portion of said hydrophilic diffusion transfer image-receiving layer.

4,217,409

IMAGE FORMING MATERIAL COMPRISING POLYACIDS OF MO OR W OR THEIR SALTS OR COMPLEXES

Eiichi Inoue, Tokyo, and Misturu Takeda, Machida, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 825,082, Aug. 16, 1977, abandoned. This application Jan. 15, 1979, Ser. No. 3,471
Claims priority, application Japan, May 12, 1977, 52/54555
Int. Cl.[3] G03C *5/24, 1/48, 1/100*
U.S. Cl. 430—346 **9 Claims**



1. A photographic image forming process which comprises irradiating an image-forming layer of an image-forming material with imagewise ultraviolet rays, said image-forming material comprising:

a substrate;

said image-forming layer provided on at least one surface of the substrate and containing an image-forming agent selected from the group consisting of of polyacids or molybdenum and tungsten and salts and complexes of these polyacids; and

a transparent polymer film substantially free of said image-forming agent provided on the image-forming layer,

wherein at least the transparent polymer film contains a weak reducing agent capable of reducing said image-forming agent when irradiated with ultraviolet rays, the transparent polymer film having a thickness of 5 to 15 microns and the image-forming layer having a thickness of 2 to 20 microns,

said weak reducing agent being selected from the group consisting of D-glucose and reducing polymer compounds, each of the reducing polymer compounds being characterized in that when a mixture of one part by weight thereof with two parts by weight of phosphomolybdic acid is supplied as a film on a polyester film and irradiated for one hour by a 250 watt mercury lamp from a distance of 20 cm., the difference between the values of the MacBeth optical diffusion transmission density respectively before and after irradiation becomes greater than 0.01.

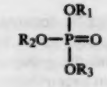
4,217,410

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS WITH PHOSPHATE SOLVENT

Kotaro Nakamura, and Akio Mitsui, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Asigara, Japan

Filed Mar. 8, 1979, Ser. No. 19,018
Claims priority, application Japan, Mar. 10, 1978, 53-27448
Int. Cl.[2] G03C *1/40, 1/10*
U.S. Cl. 430—546 **12 Claims**

1. Silver halide color photographic light-sensitive materials comprising a support and at least one silver halide emulsion layer on said support, wherein at least one of said emulsion layers contains a hydrophobic phenol type or napthol type cyan dye forming coupler and at least one coupler solvent represented by the following general formula (I):



(I)

wherein R_1, R_2 and R_3 represent each a branched chain alkyl group containing 8 or more carbon atoms and may be the same or different from one another, provided the sum total of carbon atoms in the compound is 24 to 40.

4,217,411

NOVEL ENRICHMENTS FOR BLOOD CULTURE MEDIA

Jack L. Le Frock, 34 Woodstream Dr., and Ronald F. Schell, 41 Delmar Pl., both of Delmar, N.Y. 12054

Filed Dec. 28, 1978, Ser. No. 973,956
Int. Cl.[2] C12Q *1/04;* **C12N** *1/38, 1/20;* **C12R** *1/21*
U.S. Cl. 435—34 **10 Claims**

1. An enrichment for blood culture media which comprises Fildes and additional compounds in amounts per 100 ml of Fildes as follows:

Vitamin B_{12}	0.1–20 mg
Nicotinamide adenine dinucleotide	10.0–40 mg
L-Glutamine	100.0–2000 mg
Co-enzyme A	0.1–80 mg
Pyruvate (Sodium)	120.0–2500 mg
Catalase	1.0–20 μg
Glutamate	50.0–1000 mg
Vitamin K_1	10.0–500 μl
Co Carboxylase	0.1–500 mg
Cysteine hydrochloride	0.3–750 mg

4,217,412

PRODUCTION OF TUMOR ANGIOGENESIS FACTOR BY CELL CULTURE

William R. Tolbert, Manchester; Joseph Feder, University City; Mau-Jung Kuo, Creve Coeur, all of Mo., and Moses J. Folkman, Brookline, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 25, 1979, Ser. No. 33,274
Int. Cl.[2] C12P *21/00*
U.S. Cl. 435—68 **7 Claims**

1. Process for the production of human TAF in vitro comprising growing the human medulloblastoma cell line TE-671 in agitated, liquid suspension of nutrient culture medium at about 35–38° C. for a sufficient time to elaborate TAF and recovering the resulting TAF from the cells or cell product.

4,217,413

NOVEL MALTULOSE-CONTAINING SYRUPS AND PROCESS FOR MAKING THE SAME

Raoul Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Jan. 22, 1979, Ser. No. 5,524
Int. Cl.[2] C12D *13/02;* **C13K** *1/06*
U.S. Cl. 435—94 **5 Claims**

1. A process for preparing a sweet syrup composition comprising the steps of:

a. first subjecting a maltose-containing starch hydrolyzate, containing at least 40% maltose and not more than 5% dextrose, to an alkaline isomerization treatment to isomerize a portion of the maltose to maltulose, said isomerization being conducted so as to provide from 10% to 60% maltulose, by weight dry basis, in the hydrolyzate,

b. then subjecting the hydrolyzate to the action of glucoamylase under conditions which will cause the glucoamylase to saccharify the maltose and the saccharides having a degree of polymerization greater than 2 present in the

hydrolyzate, without saccharifying the maltulose, the saccharification reaction being conducted until the hydrolyzate contains from 0% to 25% maltose plus at least 40% dextrose, and

c. subjecting the resulting hydrolyzate to an isomerization reaction to isomerize up to 50% of the dextrose to levulose.

4,217,414

PROCESS FOR SEPARATING AND RECOVERING VITAL WHEAT GLUTEN FROM WHEAT FLOUR AND THE LIKE

Raoul G. P. Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. No. 802,860, Jun. 2, 1977, abandoned, which is a continuation of Ser. No. 737,248, Nov. 1, 1976, abandoned. This application Jul. 10, 1978, Ser. No. 922,910

Claims priority, application Belgium, Oct. 28, 1977, 860225

Int. Cl.[2] C12P *19/22, 19/20, 19/14;* C07G *7/00*

U.S. Cl. 435—95 16 Claims

1. A process for treating a mixture of vital wheat gluten and wheat starch obtained from wheat flour containing at least 25% protein comprising:

(a) preparing an aqueous suspension of said mixture;

(b) subjecting the aqueous suspension to the action of bacterial alpha-amylase is substantially free of protease and is derived from a bacillus microorganism under conditions whereby a substantial amount of said starch is solubilized without undergoing gelatinization, said conditions comprising a temperature of from about 45° to about 80° C., a pH of from about 5 to about 7, and a time of less than 6 hours; and

(c) separating solid, vital gluten from the solubilized starch.

4,217,415

IMMOBILIZATION OF AN ENZYME SUBSTRATE

Raymond C. Barabino, Toledo, and Melvin H. Keyes, Sylvania, both of Ohio, assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 14, 1978, Ser. No. 886,504

Int. Cl.[2] C07G *7/02;* G01N *31/14, 31/08;* C12D *13/04*

U.S. Cl. 435—98 8 Claims

1. A method for forming an immobilized starch enzyme substrate-support composite comprising the steps of adding an immobilized starch hydrolyzing enzyme to a starch suspension, and allowing said enzyme to react with said starch to form starch fragments in said suspension, then removing said enzyme from said suspension, and forming a suspension of a solid, inert, inorganic, substantially porous support, then depositing said starch fragments on said solid support and mixing said starch and said support with a modifying agent selected from a group consisting of: an aliphatic dihalide, an epoxyhalogen, and an aliphatic diamine to increase the affinity of said starch for said support.

4,217,416

BIOTRANSFORMATION PREPARATION OF 2,3-DIHYDROXYBENZOIC ACID

Gaston O. Daumy, Gales Ferry, Conn., assignor to Pfizer, Inc., New York, N.Y.

Filed Apr. 19, 1979, Ser. No. 31,626

Int. Cl.[2] C12P *7/42*

U.S. Cl. 435—146 3 Claims

1. A process for preparing 2,3-dihydroxybenzoate which comprises contacting m-hydroxybenzoate with the cells of *Pseudomonas testosteroni* ATCC 31492 or 3-hydroxybenzoate-2-hydroxylase obtained therefrom at a pH of 5 to 9 and a temperature of 20° to 45° C. until the bioconversion is substantially complete.

4,217,417

RESIN CHELATES

Robert L. Smith, Hounslow, England, assignor to Diamond Shamrock (Polymers) Limited, United Kingdom

Filed Apr. 26, 1978, Ser. No. 900,359

Claims priority, application United Kingdom, Apr. 29, 1977, 17984/77

Int. Cl.[2] C12N *11/08;* C12P *19/20*

U.S. Cl. 435—180 6 Claims

1. An enzymatically active enzyme-support complex comprising a resin having pendant chelating groups, a metal, and an enzyme having activity independent of the presence of the metal and the chelating resin, wherein the metal is chelated by both the chelating groups of the resin and the enzyme through coordinate bonds such that there is no localized charge on the metal.

4,217,418

RECOVERY OF SMALL PARTICLES BY FLOW CENTRIFUGATION

William J. McAleer, Ambler, and William M. Hurni, North Wales, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 904,097, May 8, 1978, abandoned. This application Mar. 9, 1979, Ser. No. 18,385

Int. Cl.[2] A61K *39/12;* C12K *7/00*

U.S. Cl. 435—239 6 Claims

1. In a continuous flow centrifugation process for the direct extraction of small size particles from a proteinaceous liquid wherein the proteinaceous liquid is continuously fed to the flow centrifuge and extracted proteinaceous liquid is continuously withdrawn from the flow centrifuge during extraction under conditions which favor formation of gradient lock, the improvement comprising removing flocculent material from the proteinaceous liquid, pre-cooling the proteinaceous liquid before feeding it to the flow centrifuge, feeding the proteinaceous liquid at a low flow rate effective to provide efficient extraction of the small size particles as the proteinaceous liquid passes through the flow centrifuge which contains a multi-step gradient wherein the density differential between adjacent gradient densities is sufficiently small to prevent gradient lock.

4,217,419

DRIED LACTIC ACID BACTERIA COMPOSITION

Tadao Suzuki, Tokyo, Japan, assignor to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 845,931

Claims priority, application Japan, Oct. 28, 1976, 51-129843

Int. Cl.[2] C12N *1/20, 1/04;* C12Q *1/29*

U.S. Cl. 435—253 3 Claims

1. A dried lactic acid bacteria compostion capable of being reconstituted to aqueous solution by the addition of water thereto consisting essentially of viable lactic acid bacteria and preserving amounts of sodium alginate prepared by forming a suspension of lactic acid bacteria in a solution containing sodium alginate in an amount effective for preserving said lactic acid bacteria, and dehydrating the resulting suspension.

4,217,420

ACTIVE DRIED BAKER'S YEAST

Arend Langejan, Delft, Netherlands, assignor to Gist-Brocades N.V., Delft, Netherlands

Continuation of Ser. No. 789,423, Apr. 21, 1977, abandoned, which is a continuation of Ser. No. 435,407, Jan. 21, 1974, abandoned, which is a division of Ser. No. 262,727, Jun. 14, 1972, Pat. No. 3,843,800, which is a continuation of Ser. No. 874,723, Nov. 6, 1969, abandoned. This application Sep. 18, 1978, Ser. No. 943,134

Claims priority, application United Kingdom, Nov. 8, 1968, 52950/68

The portion of the term of this patent subsequent to Oct. 21, 1991, has been disclaimed.

Int. Cl.[2] C12C *11/32*

U.S. Cl. 435—256 **7 Claims**

1. An active dried bakers' yeast with a particle size of 0.1 to 1.0 mm with a dry matter content of at least 85% by weight, a protein content (%N×6.25) 45 to 60% based on dry matter and an activity value of 420 to 600 when determined by test method B[2] prepared by the steps of dividing a fresh compressed yeast having a protein content (%N×6.25) of 45 to 60% on dry weight basis into a mass of particles having a particle size of 0.2 to 2.0 mm and drying the mass of particles by passing therethrough a drying gas at a temperature of not more than 160° C. in not more than 120 minutes to a dry matter content of at least 85% by weight with a drying gas flow so that the particles are held within a temperature range of from 20° to 50° C. to obtain a dried bakers' yeast, said compressed yeast prior to drying having added thereto at least one member selected from the group consisting of 0.5 l to 5% based on dry matter of the yeast a swelling agent selected from the group consisting of methyl cellulose and carboxymethyl cellulose and 0.5 to 5% based on dry matter of the yeast a wetting agent selected from the group consisting of an ester of a saturated and unsaturated fatty acid, a fatty acid ester of glycerol, a fatty acid ester of propylene glycol and a mixture of two or more thereof.

4,217,421

ANION EXCHANGE RESINS PREPARED FROM CROSSLINKED POLYSTYRENESULFONYLCHLORIDE

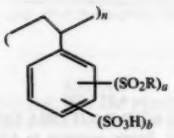
Glenn H. Beasley, Cheltenham, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 810,340, Jun. 27, 1977, abandoned. This application Apr. 17, 1978, Ser. No. 897,067

Int. Cl.[2] C08F *8/32, 8/38*

U.S. Cl. 521—32 **21 Claims**

1. As a novel composition crosslinked polystyrenyl sulfonamide anion exchange resin substantially free of secondary crosslinking and having a general formula:



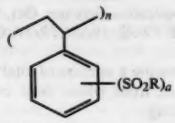
wherein the expression

is used to denote a polymer chain, R is selected from polyamines and quaternary ammonium salts, in either case containing a single primary or secondary amine group which is linked to the sulfonyl group of the polymer, and also containing at least one functional ion exchange group selected from tertiary amine and quaternary ammonium groups and mixtures thereof, a is a number between about 0.7 and 2.0 and b is a number between about 0 and 0.4.

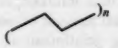
9. A crosslinked polystyrenyl sulfonylchloride resin substantially free of sulfonic acid groups and containing between 0.7 and 2.0 sulfonyl chloride groups for each styrene group and no more than 0.2 sulfonic acid groups per styrene group, when prepared from an insoluble crosslinked copolymer comprising between about 1.0% and 20% by weight of the copolymer of a polyvinyl comonomer crosslinking agent.

10. A process for preparing a polystyrenyl sulfonylchloride resin substantially free of sulfonic acid groups and containing between 0.7 and 2.0 sulfonyl chloride groups for each aromatic ring which comprises reacting chlorosulfonic acid with a crosslinked polystyrene in the presence of a chlorinating agent.

16. A process for preparing a crosslinked polystyrenyl anion exchange resin substantially free of secondary crosslinking and having the general formula:



wherein the expression



is used to denote a polymer chain, a is a number between about 0.7 to 2.0, and R is selected from polyamine and quaternary ammonium salts, in either case containing a single primary or secondary amine group which is linked to the sulfonyl group of the polymer, and also containing at least one functional ion exchange group selected from tertiary amine and quaternary ammonium groups and mixtures thereof, which comprises amidating under anhydrous conditions a crosslinked polystyrenyl sulfonylchloride resin with a polyamine containing a single reactive primary or secondary amine group and at least one functional ion exchange group, or precursor thereof, selected from tertiary amine or protected amine groups, using at least one mole of polyamine per mole of sulfonyl chloride and thereafter converting any protected amine groups to tertiary amine groups and optionally quaternizing one or more of the tertiary amine groups to ammonium groups.

4,217,422

HIGH RESILIENCY POLYURETHANE FOAMS

George J. Wasilczyk, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 763,953, Jan. 31, 1977, Pat. No. 4,108,791. This application Mar. 27, 1978, Ser. No. 890,744

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—122 **6 Claims**

1. Flexible polyurethane foams resulting from subjecting to foaming conditions a composition which comprises:

(A) a polyol composition consisting essentially of

(1) from about 50 to 100 percent by weight of a primary hydroxyl-containing polyether triol having an average hydroxyl equivalent weight of from about 900 to about 2500;

(2) from 0 to about 50 percent by weight of a diol, a triol, or mixtures thereof wherein said polyols have an average hydroxyl equivalent weight of from about 900 to about 2500;

(B) an organic polyisocyanate consisting of

(1) from about 50 to about 100 percent by weight of 2,4-toluene diisocyanate, 2,6-toluene diisocyanate, NCO-containing prepolymers thereof, or mixtures thereof, and

(2) from 0 to about 50 percent by weight of an organic

polyisocyanate having an average functionality of at least 2;

(C) from about 0.1 to about 5.0 parts per 100 parts by weight of Component (A) of silica as an inorganic filler having a pH of from about 6.5 to about 8.5 and an average effective particle size of less than about 7 microns;

(D) from about 1.0 to about 5 parts by weight of water per 100 parts by weight of Component (A);

(E) from 0 to about 20 parts of a low boiling auxiliary blowing agent per 100 parts by weight of Component (A);

(F) from about 0 to about 10 parts per 100 parts by weight of Component (A) of a crosslinker component;

(G) from about 0.5 to about 4 parts by weight per 100 parts by weight of Component (A) of a catalyst or catalysts for urethane formation;

(H) from about 0.005 to about 2.5 parts per 100 parts by weight of Component (A) of a silicone oil cell control agent; and

wherein Components (A), (B), (D) and (F) are present in quantities so as to provide an NCO:active hydrogen equivalent ratio of from about 0.8:1.0 to about 1.3:1.0.

4,217,423

RAPID FILTRATION OF ETHYLENE-VINYL ESTER INTERPOLYMER PARTICLES FROM AQUEOUS DISPERSIONS THEREOF

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,647
Int. Cl.[2] C08F 6/22, 6/24, 8/12
U.S. Cl. 525—62 **9 Claims**

1. In a process for recovering finely divided ethylene-vinyl ester interpolymer particles containing at least about 30% by weight of copolymerized vinyl ester from aqueous dispersion media in which the particles are present in admixture with a surface active dispersing agent, the improvement which comprises adding an anti-coalescing amount of a lower saturated aliphatic monohydroxyl alcohol to the aqueous dispersion media as an anti-coalescing agent accompanied by, or followed with, agitation prior to recovering the ethylene-vinyl ester interpolymer particles from the media and thereafter recovering the interpolymer particles from the media to provide a substantially aggregate-free, alcohol-wet ethylene-vinyl ester interpolymer particles.

7. The process of claim 1 in which the alcohol-wet interpolymer particles are alcoholyzed to provide an ethylene-vinyl ester-vinyl alcohol terpolymer or ethylene-vinyl alcohol copolymer.

4,217,424

IMPACT MODIFICATION OF POLYGLUTARIMIDES

Richard H. Weese, Washington Crossing, and Thomas M. Yarnell, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 7, 1979, Ser. No. 36,951
Int. Cl.[2] C08L 9/00, 13/00, 51/04, 69/00
U.S. Cl. 525—67 **7 Claims**

1. Process for improving the impact strength of polyglutarimides comprising blending therewith a mixture of at least two multiple stage polymer impact modifiers, said impact modifiers having rubbery cores and hard polymer shells, one of said impact modifiers having a core polymerized from butadiene and the second of said impact modifiers having a core polymerized from C_2–C_6 alkyl acrylate.

4,217,425

PAPER FIBER ADDITIVE CONTAINING POLYACRYLAMIDE BLENDED WITH GLYOXAL AND POLYMERIC DIALLYLDIMETHYL AMMONIUM CHLORIDE AS A CATIONIC REGULATOR

Edward G. Ballweber, Glenwood; Roger H. Jansma, Park Forest, and Kenneth G. Phillips, River Forest, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 6, 1978, Ser. No. 957,952
Int. Cl.[2] D21D 3/00; D21H 3/52
U.S. Cl. 525—155 **5 Claims**

1. A non-ionic water-soluble acrylamide homopolymer blend with glyoxal and containing polymeric diallyldimethyl ammonium chloride as a cationic regulator wherein the blend is utilized as a paper fiber additive and further wherein said blend is comprised of (1) polyacrylamide 40–95% by weight; (2) polydiallyldimethyl ammonium chloride 4–14% by weight; and (3) glyoxal 2–50% by weight, and which is utilized in a dosage of 0.2–5% based on dry weight of fiber.

4,217,426

POLYESTER/LOW-VISCOSITY POLYETHYLENE MELT BLENDS FOR POWDER ADHESIVES OR POWDER COATING MATERIALS

Richard L. McConnell, Kingsport, and Doyle A. Weemes, Greeneville, both of Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 851,320, Nov. 14, 1977, Pat. No. 4,155,952. This application Jan. 19, 1979, Ser. No. 4,951
The portion of the term of this patent subsequent to May 22, 1996, has been disclaimed.
Int. Cl.[2] C08L 67/06
U.S. Cl. 525—173 **8 Claims**

1. An improved polyester suitable for powder adhesives and powder coating materials comprising an intimate melt blend of (A) a semicrystalline polyester having an inherent viscosity ranging from about 0.4 to 1.2, a melting point of about 80°–155° C. and an apparent heat of fusion of ≧10 calories per gram selected from the group consisting of copolyester containing from 100 to 60 mole percent terephthalic acid, 0 to 40 mole percent isophthalic acid, 100 to 35 mole percent 1,6-hexanediol and 0 to 65 mole percent 1,4-butanediol; and (B) a low molecular weight polyethylene having a melt viscosity ranging from about 50 to 30,000 centipoises at 150° C., a density at 25° C. of about 0.90 to 0.98 and an acid number of about 0–80; wherein said low molecular weight polyethylene is present in the blend in an amount of from about 3 to about 30% by weight.

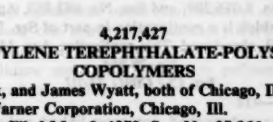
4,217,427

POLYBUTYLENE TEREPHTHALATE-POLYSTYRENE COPOLYMERS

John C. Falk, and James Wyatt, both of Chicago, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 2, 1979, Ser. No. 35,366
Int. Cl.[2] C08L 67/02
U.S. Cl. 525—176 **2 Claims**

2. A method for increasing the 264 psi heat deflection temperature of polybutylene terephthalate consisting of copolymerizing therewith from 5 to about 30 wt %, based on final copolymer, of a diol-terminated polystyrene of the formula:



wherein R is selected from the group lower alkyl and hydrogen and wherein n is a positive integer between 50 and 500.

4,217,428

BLENDS OF SUBSTANTIALLY AMORPHOUS HIGHER 1-OLEFIN COPOLYMERS AND TACKIFYING RESINS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

Richard L. McConnell, Kingsport; Doyle A. Weemes, Greeneville, and Frederick B. Joyner, Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 654,317, Feb. 2, 1976, Pat. No. 4,072,812, which is a continuation-in-part of Ser. No. 563,534, Mar. 31, 1975, Pat. No. 3,954,697. This application Nov. 7, 1977, Ser. No. 849,373

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.[2] C08L *23/18, 23/20;* C09J *3/14*

U.S. Cl. 525—191 10 Claims

1. An adhesive composition capable of being used as a hot melt, pressure sensitive adhesive comprising a blend of

(1) about 99 to 60 weight percent of at least one member selected from the group consisting of a propylene/higher 1-olefin copolymer, a 1-butene/higher 1-olefin copolymer, and a propylene/1-butene/higher 1-olefin copolymer, said copolymer containing 40 to 60 mole percent of at least one higher 1-olefin of 6 to 10 carbon atoms and having a melt viscosity of 10,000 to 75,000 centipoise at 190° C., and

(2) 1 to 40 weight percent of at least one tackifying resin.

3. An adhesive composition capable of being used as a hot melt pressure sensitive adhesive comprising a blend of

(1) 90 to 60 weight percent of a propylene/higher 1-olefin copolymer, a 1-butene/higher 1-olefin copolymer, and a propylene/1-butene/higher 1-olefin copolymer containing 40 to 60 mole percent of at least one higher 1-olefin of 6 to 10 carbon atoms and having a melt viscosity of 10,000 to 75,000 centipoise at 190° C., and

(2) 10 to 40 weight percent of at least one tackifying resin selected from the group consisting of hydrocarbon resins, and polyterpene resins.

4,217,429

POLY-[(METHYLIMINO)TRIMETHYLENE]

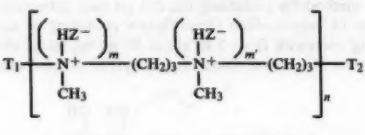
Arthur F. Wagner, Princeton; Nathaniel Grier, Englewood, and Tsung-Ying Shen, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 895,908, Apr. 13, 1978, which is a division of Ser. No. 783,886, Apr. 1, 1977, Pat. No. 4,098,726, which is a continuation-in-part of Ser. No. 570,910, Apr. 23, 1975, Pat. No. 4,016,209, and Ser. No. 462,263, Apr. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 369,042, Jun. 11, 1973, abandoned. This application Apr. 11, 1979, Ser. No. 28,954

Int. Cl.[3] C08G *73/02*

U.S. Cl. 525—411 2 Claims

1. A linear unbranched non-cross-linked polymer of the formula:



wherein

n is an integer such that the number average, molecular weight is from 300–50,000,

m and m′ are independently 0 or 1,

T_1 and T_2 are end groups, and

Z^- is a monovalent or polyvalent counter anion.

4,217,430

GRAFT COPOLYMER OF NEUTRALIZED ACID COPOLYMER TRUNK AND POLYAMIDE OLIGOMERIC BRANCHES AND METHOD FOR MAKING SUCH COPOLYMER

Howard W. Starkweather, Jr., Greenville, Del., and Michael J. Mutz, Fayetteville, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 1, 1978, Ser. No. 930,602

Int. Cl.[2] C08L *77/00*

U.S. Cl. 525—183 29 Claims

1. A process for making a graft copolymer comprising the steps of

neutralizing some of the carboxylic acid groups on a trunk copolymer derived from ethylene and α,β-ethylenically unsaturated monocarboxylic acid by reactive contact between the carboxylic acid groups and metal ions selected from the group consisting of zinc, cadmium, and lead and

adding a polyamide oligomer in reactive contact with the carboxylic acid groups and in the presence of the metal ions in the trunk copolymer

whereby the polyamide oligomer is grafted onto the trunk copolymer by an amino group on the oligomer to a carboxylic acid group on the trunk copolymer.

4,217,431

MANUFACTURE OF ETHYLENE COPOLYMERS

Wieland Zacher; Klaus Pfleger; Klaus Boettcher, all of Wesseling; Ronald Skorczyk, Bonn-Oberkassel, and Oskar Buechner, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,330

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802866

Int. Cl.[2] C08F *2/34, 6/00*

U.S. Cl. 526—68 2 Claims

1. A process for the continuous manufacture of ethylene copolymers by copolymerization of ethylene with comonomers copolymerizable therewith, in a polymerization zone at pressures of from 1,500 to 5,000 bar and at from 150° to 350° C. in the presence of polymerization initiators which decompose into free radicals, transfer of the resulting reaction mixture into a high pressure product isolation zone at a pressure of from 100 to 500 bar and at from 150° to 250° C., then into a downstream low pressure product isolation zone at a pressure of from 1 to 10 bar and at from 150° to 250° C., and thereafter into a discharge extruder, and recycling of the unconverted gas, comprising ethylene and comonomers, from the high pressure product isolation zone and the low pressure product isolation zone to the polymerization process, wherein exclusively the gas taken off the low pressure product isolation zone is compressed, cooled and fed into a low temperature separator, and the comonomers separated off are recycled to the polymerization process and wherein the unconverted gas from the high pressure product isolation zone is not expanded prior to reentry into the polymerization zone.

4,217,432

PROCESS FOR THE POLYMERIZATION OF OLEFINS

Akinobu Shiga; Yoshiharu Fukui; Kazuhiro Matsumura; Toshio Sasaki, and Masahisa Ohkawa, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 777,269, Mar. 14, 1977, Pat. No. 4,123,387. This application Aug. 2, 1978, Ser. No. 930,267

Claims priority, application Japan, Mar. 15, 1976, 51-28313

Int. Cl.[2] C08F *4/66, 10/06*

U.S. Cl. 526—119 11 Claims

1. A method for the production of olefin polymers having a high crystallinity which comprises polymerizing an olefin using:

a solid catalyst produced by preparing a titanium trichloride

composition by reducing titanium tetrachloride with an organo-aluminum compound of the formula:

R_nAlX_{3-n}

wherein R is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom or a hydrogen atom, and n satisfies the relationship $1 \leqq n \leqq 3$, at a temperature of about −100° to about 60° C. to obtain a solid reduction product, and then treating the resulting solid reduction product by one of the following methods, (a), (b), (c), (d), (e) or (f):

(a) heat-treating the solid reduction product at about 100° to about 180° C. in the absence of or presence of an inert solvent,

(b) catalytically treating the solid reduction product with an aluminum compound of the formula:

R''_pAlX_{3-p}

wherein R'' is a straight or branched alkyl group, an alicyclic group of an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 \leqq p \leqq 1.5$, and, optionally, further catalytically treating the resulting product with an ether,

(c) catalytically treating the solid reduction product with an ether and then with an aluminum compound of the formula:

R''_pAlX_{3-p}

wherein R'' is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 \leqq p \leqq 1.5$, and, optionally, further catalytically treating the resulting product with an ether,

(d) catalytically treating the solid reduction product with an ether and then with an aluminum compound of the formula:

R''_pAlX_{3-p}

wherein R'' is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 \leqq p \leqq 1.5$, in the presence of an organo-halogen compound of the formula:

$R'''X$

wherein R''' is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, and X is a halogen atom, and, optionally, further catalytically treating the resulting product with an ether,

(e) catalytically treating the solid reduction product with an ether and then with an aluminum halide of the formula:

AlX_3

wherein X is a halogen atom, dissolved in an aromatic hydrocarbon in the presence of a hydrogen halide of the formula:

HX

wherein X is a halogen atom, and, optionally, further catalytically treating the resulting product with an ether,

(f) catalytically treating the solid reduction product with an ether and then with titanium tetrachloride, and treating the thus produced titanium trichloride composition at a temperature of from about 0° to about 150° C. with a mixture of a halogenated hydrocarbon (1) represented by the formula:

CH_qX_{4-q}

wherein X is a halogen atom and q is an integer satisfying the relationship $0 \leqq q \leqq 4$, and an ether (2) represented by the formula:

$R_3—O—R_4$

wherein R_3 and R_4, which may be the same or different, each is an alkyl group, each having up to 10 carbon atoms, wherein the amount of the halogenated hydrocarbon and ether used in the catalytic treating of the titanium trichloride composition are about 0.001 to about 1.0 and about 0.001 to about 5 times on a molar basis to the amount of the titanium trichloride contained in the titanium trichloride composition, respectively; and an organo-aluminum compound of the formula:

R'_lAlX_{3-l}

wherein R' is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms; X is a halogen atom, a hydrogen atom or an alkoxy group; and l satisfies the relationship $1.5 \leqq l \leqq 3$, as an activator.

4,217,433

DIETHYLENE GLYCOL BIS(ALLYL CARBONATE) COMPOSITIONS CONTAINING CROSSLINKABLE COPOLYMERS

Christopher J. Dyball, Amherst, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 3, 1979, Ser. No. 63,231
Int. Cl.[2] C08L *23/00*
U.S. Cl. 525—277 **9 Claims**

1. A composition consisting essentially of 25 to 99 percent by weight of diethylene glycol bis(allyl carbonate) monomer, and 1 to 75 percent by weight of a copolymer having a molecular weight of 1,000 to 100,000 prepared by reacting

(i) at least one allyl ester, substituted allyl ester, N-allyl substituted amide or N-N-diallyl substituted amide of an α-B unsaturated carboxylic or dicarboxylic lic acid; or an allyl substituted monovinyl aromatic compound.

(ii) at least one lower alkyl methacrylate, optionally together with a minor amount of one or more vinyl or vinylidene monomers which are polymerizable by a free radical mechanism.

4,217,434

PRESSURE SENSITIVE ADHESIVE FORMULATION

Earl A. Koeble, Anderson, S.C., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 2, 1978, Ser. No. 947,789
Int. Cl.[2] C08K *5/52*
U.S. Cl. 525—329 **5 Claims**

1. An improved liquid acrylic pressure sensitive adhesive formulation which comprises a polyacrylate elastomer component and which, when in dried form in a pressure sensitive product, has increased adhesion to a plastic substrate due to the presence in said adhesive formulation of an effective amount for said adhesion of a monoloweralkyl acid phosphate.

4,217,435

ADHESIVE COMPOSITION

Richard L. McConnell, Kingsport, and Doyle A. Weemes, Greeneville, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 746,911, Dec. 2, 1976, abandoned. This application Aug. 28, 1978, Ser. No. 937,285

Int. Cl.[2] C08L *77/00*

U.S. Cl. 525—425 **13 Claims**

1. A hot melt adhesive composition comprising a heterogeneous mixture in finely divided form of

(A) from about 10% to about 97% by weight of a polyester having a melting point of between about 90° and about 140° C. and a heat of fusion of from about 0.1 to about 10 calories per gram, said polyester being selected from the group consisting of

(a) polyesters derived from a mixture of dicarboxylic acids, about 40 to about 80 mole percent thereof being terephthalic acid or a derivative thereof and the balance being selected from aliphatic, alicyclic and aromatic dicarboxylic acids other than terephthalic, and at least one glycol containing from 2 to 8 carbon atoms, and

(b) polyesters derived from terephthalic acid or a derivative thereof and at least one glycol having from 2 to 8 carbon atoms, with the provision that when said polyester contains ethylene glycol, said ethylene glycol is less than about 80 mole percent of the glycol,

(B) and from about 90% to about 3% by weight of a polyamide having a melting point of from about 50° C. to about 200° C.,

said polyester and said polyamide having inherent viscosities of from about 0.5 to about 1.2 as measured at 25° C. using 0.25 gram of polymer per 100 ml. of a solvent composed of 60% phenol and 40% tetrachloroethane.

4,217,436

POLYURETHANE FORMING COMPOSITIONS

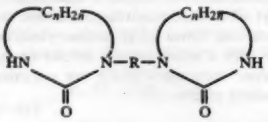
Reinhard H. Richter, North Haven; Benjamin W. Tucker, Bethany, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 874,402, Feb. 1, 1978, Pat. No. 4,138,398, which is a continuation-in-part of Ser. No. 754,189, Dec. 27, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,251

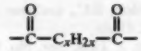
Int. Cl.[2] C08G *18/80, 18/77;* **C07D** *243/04, 245/02*

U.S. Cl. 528—45 **4 Claims**

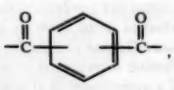
1. A polyurethane resin prepared by heating a bis cyclic urea having the formula



wherein C_nH_{2n} is alkylene from 4 to 12 inclusive and provided there are at least 4 carbon atoms in succession in the chain and R is a divalent radical selected from the group consisting of



wherein C_xH_{2x} is alkylene from 1 to 8 inclusive, and



with a polymeric polyol at a temperature sufficiently high to cause dissociation of said urea.

4,217,437

PROCESS FOR THE PREPARATION OF CARBONIC ACID BIS-DIPHENOL ESTERS OF POLYALKYLENE OXIDE-DIOLS LENGTHENED VIA CARBONATE GROUPS AND THEIR USE FOR THE PREPARATION OF HIGH-MOLECULAR, SEGMENTED POLYETHER/POLYCARBONATES WHICH CAN BE PROCESSED AS THERMOPLASTICS

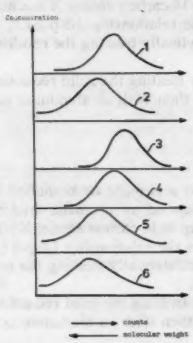
Manfred Schreckenberg; Dieter Freitag, both of Krefeld; Christian Lindner, Cologne; Carlhans Suling; Herbert Bartl, both of Odenthal, and Klaus Konig, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,773

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726416

Int. Cl.[2] C08G *63/62*

U.S. Cl. 528—171 **33 Claims**



1. A process for the preparation of a polyalkylene oxide-diol-bis-diphenol carbonate, lengthened via carbonate groups, comprising:

i. heating a polyalkylene oxide-diol having a molecular weight Mn (number average) of over 135 with a carbonic acid bis-aryl ester

a. at a temperature of between about 100° C. and 200° C.,

b. in vacuo below about 35 mm Hg, and

c. in the presence of a catalyst,

characterized in that less than 1 mol of carbonic acid bis-aryl ester is employed per mol of OH-groups of the polyalkylene oxide-diol, and

ii. heating the resulting polyalkylene oxide-diol bis-aryl carbonate with a diphenol

a. at a temperature of between about 100° C. and 200° C.,

b. in vacuo below about 35 mm Hg, and

c. in the presence of a catalyst,

characterized in that more than one mol of diphenol is employed per mol of carbonic acid aryl ester groups of the polyalkylene oxide-diol bis-aryl carbonate.

23. A process for the preparation of a polyether/polycarbonate, comprising reacting a polyalkylene oxide-diol bis-diphenol carbonate prepared by the process according to claim 1 with a diphenol and phosgene in a liquid mixture comprising an inert organic solvent and an alkaline aqueous solution, at a temperature of from about 0° to about 80° C., at a pH value of from about 9 to 14, wherein after the addition of phosgene, polycondensation is carried out by adding from about 0.2 mol % to 10 mol %, relative to the molar amount of diphenol of a tertiary amine, the weight ratio of polyalkylene oxide-diol bis-diphenol carbonate to the diphenol being determined by the desired

proportion of polycarbonate and the proportion of polyether in the resulting polyether/polycarbonate.

4,217,438

POLYCARBONATE TRANSESTERIFICATION PROCESS

Daniel J. Brunelle, Scotia, and William E. Smith, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1978, Ser. No. 970,058
Int. Cl.[2] C08G 63/62
U.S. Cl. 528—202 10 Claims

1. A polycarbonate process comprising contacting in the presence of a base, a β-fluoroaliphatic carbonate, and a polyhydroxy compound selected from alcohols and/or phenols.

4,217,439

ACRYLATE-ACETOACETAMIDE POLYMERS

John S. Heckles, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Jun. 19, 1978, Ser. No. 916,967
Int. Cl.[2] C08G 2/26
U.S. Cl. 528—220 8 Claims

1. A crosslinked acrylate-acetoacetamide polymer produced by the reaction of at least one polyfunctional acrylate with at least one diacetoacetamide in the presence of a catalyst capable of promoting the reaction between the polyfunctional acrylate and the diacetoacetamide.

4,217,440

METHOD FOR MAKING BRANCHED POLYESTERS REPRODUCIBLY

Kenneth T. Barkey, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1979, Ser. No. 68,035
Int. Cl.[3] C08G 63/04, 63/22
U.S. Cl. 528—274 20 Claims

1. In a method of preparing a branched polyester comprising:

(1) forming a condensation polymer by reacting together
(a) a diol;
(b) a diacid; and
(c) a polyfunctional modifier having at least three functional radicals; and

(2) polycondensing said polymer in the presence of a transesterification catalyst at a reaction temperature and reaction pressure effective to form a polyester by linear extension and branching, the improvement comprising polycondensing said polymer while correlating the activity of said catalyst, said temperature and said pressure to restrain the extent of reaction for said linear extension to within about 0.1 percent of the extent of reaction for said branching.

4,217,441

MODIFIED POLYESTER FILMS

John H. Bayless, Hendersonville, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 788,780, Apr. 19, 1977, abandoned. This application Mar. 29, 1978, Ser. No. 890,485
Int. Cl.[2] C08G 63/68
U.S. Cl. 528—293 11 Claims

1. A biaxially oriented, heat set linear polyester film with high water vapor permeability, wherein the polyester is comprised of a reaction product of (1) a glycol diester of a dicarboxylic acid, (2) a high molecular weight polyethylene glycol, and (3) an alkali metal salt of a sulfonic acid-substituted dicarboxylic acid ester.

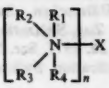
4,217,442

POLYMERIZATION OF 2-PYRROLIDONE WITH ALKALI METAL PYRROLIDONATES AND CERTAIN QUATERNARY AMMONIUM SALTS

Carl E. Barnes, 482 Trinity Pass, New Canaan, Conn. 06840, and Arthur C. Barnes, 320 Stamford Ave., Stamford, Conn. 06902

Continuation-in-part of Ser. No. 899,066, Apr. 24, 1978, abandoned. This application May 17, 1979, Ser. No. 39,773
Int. Cl.[2] C08G 69/24
U.S. Cl. 528—313 16 Claims

1. The method of polymerizing 2-pyrrolidone which comprises contacting a substantially anhydrous mixture containing monomeric 2-pyrrolidone, an alkali metal salt of 2-pyrrolidone and a quaternary ammonium salt with a polymerization activator selected from the group consisting of CO_2, SO_2 and MoO_3, the quaternary ammonium salt having the formula



wherein R_1, R_2, R_3 and R_4 are alkyl, aryl or aralkyl radicals, n is 1 or 2 depending on the valence of X, and X is an anion selected from the group consisting of sulfate and hydrogen sulfate, whereby a melt extrudable polypyrrolidone is formed.

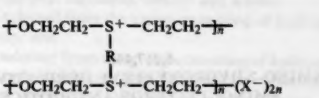
4,217,443

WATER-SOLUBLE CROSSLINKED POLYSULFONIUM COMPOUNDS AND PROCESS THEREFOR

Hans P. Panzer, Stamford; Anthony T. Coscia, Norwalk, and Albert G. Robustelli, Darien, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 19, 1979, Ser. No. 4,642
Int. Cl.[2] C08G 75/00
U.S. Cl. 528—373 8 Claims

1. A water-soluble cross-linked cationic polymer containing repeating units of the structure:



wherein R is the radical derived from a difunctional sulfide-reactive alkylating agent and n is a value such that the molecular weight of the repeating units does not exceed about 30,000 and where X represents an anion neutralizing a cationic charge of the polymer and providing a water-soluble polymer.

4,217,444

METHOD OF DEGASSING POLYMERS PREPARED BY MASS POLYMERIZING A MONOMERIC COMPOSITION BASED ON VINYL CHLORIDE

Jean-Bernard Pompon, Saint-Auban, and Salomon Soussan, Saint-Symphorien d'Ozon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 666,049, Mar. 11, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,321
Claims priority, application France, Mar. 28, 1975, 75 09798
Int. Cl.[2] C08F 6/28, 14/06
U.S. Cl. 528—499 6 Claims

1. A method of degassing polymers and copolymers prepared by polymerizing in mass a monomeric composition based on vinyl chloride, agitating the formed polymer, bringing the gas phase of the remaining monomeric composition from polymerization pressure to a pressure below 120 mm of mercury and the polymer to a temperature of at least 70° C. but below the temperature at which degradation of the polymer or copolymer commences, maintaining these conditions of pressure

and temperature substantially until the residual vinyl chloride monomer content of the polymer has been reduced to a level below 2000 ppm. contacting the polymer which has been reduced to a residual vinyl chloride monomer content to a level below 2000 ppm with a quantity of water representing 0.01% to 0.8% by weight of the polymer while continuing to maintain the temperature and pressure conditions as described above until the residual monomeric vinyl chloride content of the polymer is less than 50 ppm.

4,217,445

5-OXY-SUBSTITUTED DERIVATIVES OF PSORALENE USEFUL IN DERMATOLOGY

Eckhard Nikolaiski, Räterschen, Switzerland, assignor to Fotobio Holding AG, Zug, Switzerland

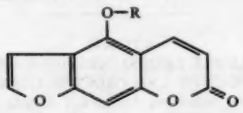
Filed May 26, 1977, Ser. No. 800,782

Claims priority, application Switzerland, May 28, 1976, 6688/76

Int. Cl.[2] C07H *17/06*; C07D *493/04*

U.S. Cl. 536—4 **8 Claims**

1. RO substituted psoralenes of the formula



wherein R is a radical selected from the group consisting of alkanoyl of not more than 10 carbon atoms, ortho-acetoxybenzoyl, α thenoyl O,O diethyl-phosphono, diethylaminoethyl, and 2'3'4'6' tetra α acetyl D-gluco pyranosyl.

4,217,446

ωAMINO-2-HYDROXYALKYL DERIVATIVES OF AMINOGLYCOSIDE ANTIBIOTICS

James W. Moore, Sandwich, England, assignor to Pfizer Inc., New York, N.Y.

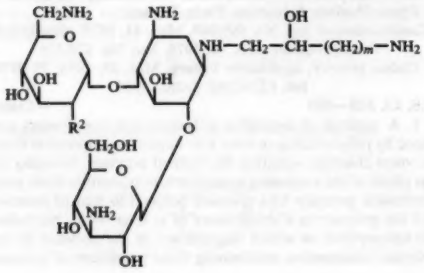
Continuation-in-part of Ser. No. 849,875, Nov. 9, 1977, which is a continuation of Ser. No. 694,571, Jun. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 624,485, Oct. 21, 1975, abandoned. This application Nov. 6, 1978, Ser. No. 957,873

Claims priority, application United Kingdom, Oct. 26, 1974, 46412/74; New Zealand, Oct. 24, 1975, 179050; South Africa, Oct. 6, 1975, 75/6326; United Kingdom, Apr. 15, 1975, 15425/75

Int. Cl.[2] C07H *15/22*; A61K *31/70*

U.S. Cl. 536—10 **10 Claims**

1. A compound selected from the group consisting of



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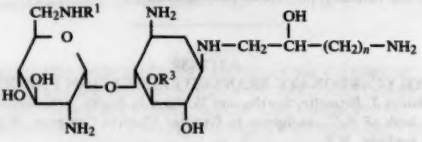


and the pharmaceutically acceptable acid-addition salts thereof;

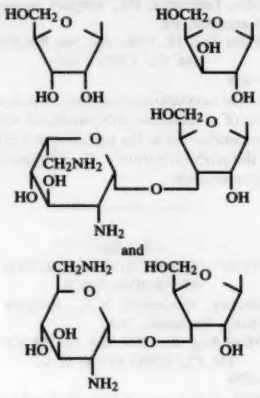
wherein R^1 is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms;

R^2 is selected from the group consisting of hydroxy and amino;

m is 1 or 2;

n is 1,2 or 3;

and R^3 is selected from the group consisting of



4,217,447

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, Great Britain

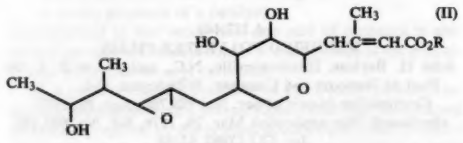
Division of Ser. No. 872,806, Jan. 27, 1978, which is a division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application Jun. 14, 1979, Ser. No. 48,618

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.[2] C07D *407/06*

U.S. Cl. 542—426 **5 Claims**

1. A compound of the formula (II):



(II)

wherein R is alkyl of 1 to 20 carbon atoms, alkenyl of 2 to 8 carbon atoms or alkynyl of 2 to 8 carbon atoms substituted by cycloalkyl of 3 to 7 carbon atoms unsubstituted or substituted by alkyl of 1 to 6 carbon atoms or aryl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, amino, carboxy, alkoxycarbonyl of 1 to 6

carbon atoms, in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms in the alkoxy moiety and 1 to 6 carbon atoms in the alkyl moiety.

4,217,448

ANTIBACTERIAL COMPOUNDS

Kong Luk, Cranleigh; John P. Clayton, Horsham, and Norman H. Rogers, Rudgwick, all of England, assignors to Beecham Group Limited, England

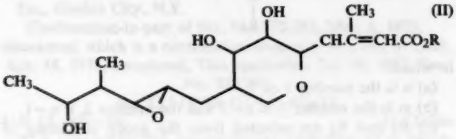
Division of Ser. No. 872,806, Jan. 27, 1978, which is a division of Ser. No. 803,466, Jun. 6, 1977, Pat. No. 4,102,901. This application Jun. 18, 1979, Ser. No. 49,237

Claims priority, application United Kingdom, Jun. 15, 1976, 24712/76; Sep. 29, 1976, 40472/76; Mar. 1, 1977, 8647/77

Int. Cl.² C07D *407/06*

U.S. Cl. 542—427 **9 Claims**

1. A compound of the formula (II):



wherein R is cycloalkyl of 3 to 7 carbon atoms unsubstituted or substituted by alkyl of 1 to 6 carbon atoms; or aryl unsubstituted or substituted by up to 5 substituents selected from the group consisting of halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, haloalkyl of 1 to 6 carbon atoms, hydroxy, amino, carboxy, alkoxycarbonyl of 1 to 6 carbon atoms in the alkoxy moiety and alkoxycarbonylalkyl of 1 to 6 carbon atoms, in the alkoxy moiety and 1 to 6 carbon atoms in the alkyl moiety.

4,217,449

PROCESS FOR THE PREPARATION OF BIS-TRIAZOLYLSTILBENES

Alfons Dorlars, Leverkusen, and Otto Neüner, Berg. Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

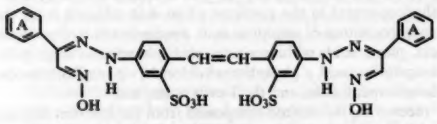
Filed Oct. 11, 1978, Ser. No. 950,438

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746000

Int. Cl.² C07D *249/06*

U.S. Cl. 542—462 **2 Claims**

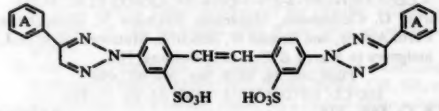
1. In the reaction of a bis-hydroxyiminohydrazonostilbene compound of the formula



wherein

the phenyl radicals A can be substituted by halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy,

with a cyclizing agent to produce the corresponding bis-triazolylstilbene compound of the formula



the improvement wherein the cyclizing agent is a lower carboxylic acid anhydride and the reaction is effected in the presence of urea and a polar solvent at from 10° to 60° C.

4,217,450

IMIDAZOLEDICARBOXYLIC ACID SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Naohiko Yasuda, Yokosuka; Chikahiko Eguchi; Masaru Okutsu, both of Kawaski, and Yoshiteru Hirose, Kamakura, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

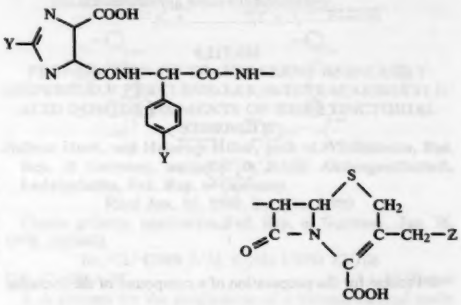
Filed Jun. 7, 1978, Ser. No. 913,369

Claims priority, application Japan, Jun. 16, 1977, 52-71468

Int. Cl.² C07D *501/36, 501/34, 501/56*

U.S. Cl. 544—25 **7 Claims**

1. A compound having the following formula:



wherein

X is a group selected from the group consisting of hydrogen, halogen, hydroxy, mercapto, methyl and amino;

Y is a group selected from the group consisting of hydrogen and hydroxy; and

Z is a group selected from the group consisting of hydrogen, acetoxy, carbamoyloxy, (thiadiazolyl)thio, (methyltetrazolyl)thio, pyridinium, quinolinium, and picolinium;

and salts thereof.

4,217,451

PROCESS FOR THE RECOVERY OF SOLID CYANURIC CHLORIDE (B)

Ralf Goedecke, Rodenbach; Uwe Kurandt, Frankfurt, and Rolf Möller, Babenhausen, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

Filed Aug. 15, 1979, Ser. No. 66,827

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843378

Int. Cl.² C07D *251/28*

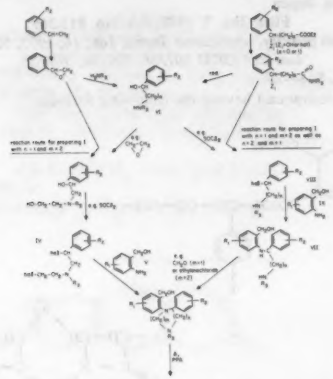
U.S. Cl. 544—190 **16 Claims**

1. A process for recovering solid cyanuric chloride comprising spraying liquid cyanuric chloride in the presence of a cooling medium, said process including the steps of spraying the liquid cyanuric chloride with the aid of a first spraying means into a separatory container, simultaneously spraying a liquid cooling medium through a second spraying means into said container, withdrawing the solidified cyanuric chloride from said container and drawing off the resulting gaseous cooling medium containing cyanuric chloride from the lower portion of said container.

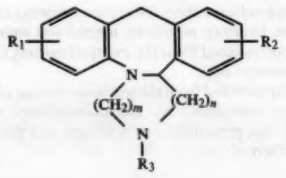
4,217,452
SYNTHESIS FOR THE PREPARATION OF TETRACYCLIC COMPOUNDS

Jacques Olivie, Gisors, France, assignor to Akzona Incorporated, Asheville, N.C.

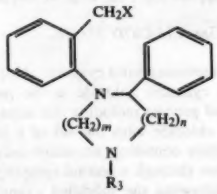
Continuation-in-part of Ser. No. 547,680, Feb. 6, 1975, Pat. No. 4,025,513. This application Dec. 27, 1976, Ser. No. 754,216
Claims priority, application Netherlands, Feb. 9, 1974, 7401807
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] C07D *239/74, 241/38*
U.S. Cl. 544—246 5 Claims



1. Process for the preparation of a compound of the formula:



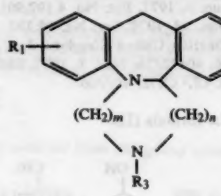
in which:
(a) n is the number 1 or 2,
(b) m is the number 1, if n=2 and the number 2, if n=1,
(c) R_1 and R_2 are selected from the group consisting of hydrogen, hydroxy, halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, and trifluoromethyl, and
(d) R_3 is selected from the group consisting of hydrogen and alkyl having 1 to 6 carbon atoms,
which comprises the step of:
ring closing a compound of the formula:



(III)

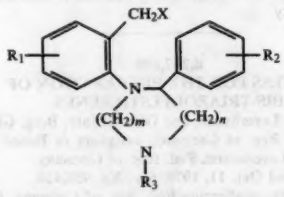
or a salt thereof, in which n, m, R_1, R_2, and R_3 have the aforesaid meanings and X represents methoxy, in the presence of an acid selected from the group consisting of sulphuric acid, concentrated hydrochloric acid, picric acid, trifluoroacetic acid, phosphoric acid, polyphosphoric acid, phosphoroxychloride, phosphortrioxide, phosphorpentoxide, and the Lewis acids; and
recovering the desired compound from the reaction mixture in the form of its free base or acid addition salt.

2. Process for the preparation of a compound of the formula:



(I)

in which
(a) n is the number 1 or 2,
(b) m is the number 1, if n=2 and the number 2, if n=1,
(c) R_1 and R_2 are selected from the group consisting of hydrogen, hydroxy, halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, and trifluoromethyl, and
(d) R_3 is selected from the group consisting of hydrogen and alkyl having 1 to 6 carbon atoms, which comprises the step of:
ring closing a compound of the formula:



III

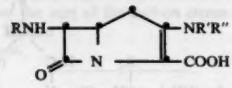
or a salt thereof, in which n, m, R_1, R_2, and R_3 have the aforesaid meanings and X represents $(CH_3)_3SiO$—, or an etherified hydroxy group characterized by the formula OR, wherein R is silyl, alkyl of 1 to 6 carbon atoms, phenylalkyl of 7 to 10 carbon atoms, cycloalkyl of 5 to 10 carbon atoms, cycloalkylalkyl of 5 to 10 carbon atoms, alkenyl of 2 to 6 carbon atoms, or 2-tetrahydropyranyl in the presence of an acid selected from the group consisting of sulphuric acid, concentrated hydrochloric acid, picric acid, trifluoroacetic acid, phosphoric acid, polyphosphoric acid, phosphoroxychloride, phosphortrioxide, phosphorpentoxide, and the Lewis acids; and
recovering the desired compound from the reaction mixture in the form of its free base or acid addition salt.

4,217,453
6-AMIDO-3-SUBSTITUTED-AMINO-1-AZABICYCLO[3.2.0]HEPT-2-EN-7-ONE-2-CARBOXYLIC ACID

Burton G. Christensen, Metuchen; Ravindra N. Guthikonda, Perth Amboy, and Ronald W. Ratcliffe, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 24, 1978, Ser. No. 927,449
Int. Cl.[2] C07D *487/04;* A61K *31/40, 31/495*
U.S. Cl. 544—373 4 Claims

1. The compound having the structure:



wherein

R is phenylacetyl, thienylacetyl, α-azidophenylacetyl, α-carboxylphenylacetyl, and phenoxyacetyl;

R' and R" are the same or different and are hydrogen, alkyl of 1–10 carbon atoms, or NR'R" together are N-methylpiperazinyl.

4,217,454

PROCESS FOR STEREOSELECTIVELY REDUCING INDOLE DERIVATIVES

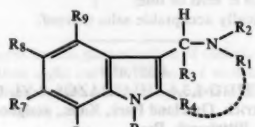
Joel G. Berger, Verona, N.J., assignor to Endo Laboratories, Inc., Garden City, N.Y.

Continuation-in-part of Ser. No. 773,282, Mar. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 677,438, Apr. 15, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,191

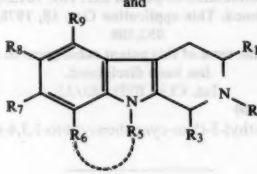
Int. Cl.[2] C07D *471/04, 471/14*

U.S. Cl. 546—50 **11 Claims**

1. A process for the stereoselective reduction of an indole compound selected form the group consisting of a compound having one of the following formulas:



and



wherein

R_1 can be an alkyl of 1 through 5 carbon atoms or can be linked with R_4 to form an ethylene group;

R_2 can be an alkyl of 1 through 5 carbon atoms, benzyl, benzyl substituted with methyl, methoxy or chloro; phenethyl, 3-phenylpropyl, 3-phenylpropyl with the phenyl ring substituted with chloro, bromo, or methoxy; C_3–C_5-cycloalkyl; furfuryl; 2-thenyl; C_4–C_8 cycloalkyl=methyl;(methylcyclopropyl)methyl; (cis-2,3-dimethylcyclo=propyl)methyl; exo-7-norcarylmethyl; (4-methylbicyclo=[2.2.2]oct-1-yl)methyl; (bicyclo[2.2.1.]hept-2-yl)methyl; 1-adamantylmethyl, or a 2-adamantylmethyl group;

R_3 can be hydrogen or alkyl of 1 through 4 carbon atoms;

R_4 can be (a) phenyl, (b) phenyl substituted with one or more halogen, NH_2, NHR, $N(R)_2$, OR, SR or CF_3 groups, (c) a carbon chain, (d) a carbon chain substituted with one or more halogen, OR, SR, NH_2, NHR, $N(R)_2$ or CF_3 groups, or (e) a carbon chain interrupted by oxygen, sulfur, or nitrogen, or can be linked with R_1 to form an ethylene group;

R_5 can be (a) hydrogen, (b) phenyl, (c) phenyl substituted with one or more halogen, NH_2, NHR, $N(R)_2$, OR, SR, or CF_3 groups, (d) a carbon chain, (e) a carbon chain substituted with one or more halogen, OR, SR, NH_2, NHR, $N(R)_2$ or CF_3 groups, or (f) a carbon chain interrupted by oxygen, sulfur, or nitrogen, or can be linked with R_6 to form an o-phenyleneethylene group;

R_6 can be linked with R_5 to form an o-ethylenephenylene group; or

R_6–R_9 can each be independently selected from (a) hydrogen, halogen, OR, SR, NH_2, NHR, $N(R)_2$ or CF_3, (b) a carbon chain interrupted by oxygen, sulfur, or nitrogen;

R_{10} can be hydrogen, methyl or ethyl; in which R can be an alkyl group of 1 through 5 carbon atoms. which comprises the sequential steps of:

(a) reacting a strong acid addition salt of the indole compound in which the strong acid which forms the addition salt is selected from the group consisting of hydrochloric, sulfuric, phosphoric, methanesulfonic, benzenesulfonic and 4-methylbenzene sulfonic acids with a borohydride of an alkali metal or alkaline earth metal in an appropriate solvent in the absence of acid; and

(b) acidifying the reaction product of step (a) with a mineral acid by which it is reduced and hydrolyzed to form the corresponding trans-dihydroindole.

4,217,455

PREPARATION OF TRANSPARENT AND EASILY DISPERSIBLE PERYLENE-3,4,9,10-TETRACARBOXYLIC ACID DIIMIDE PIGMENTS OF HIGH TINCTORIAL STRENGTH

Helmut Hoch, and Heinrich Hiller, both of Wachenheim, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 16, 1979, Ser. No. 3,980

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1978, 2803362

Int. Cl.[2] C09B *3/18, 67/00;* **C07D** *471/06*

U.S. Cl. 546—37 **11 Claims**

1. A process for the preparation of a transparent and easily dispersible pigmentary form, of high tinctorial strength of perylene-3,4,9,10-tetracarboxylic acid bis-p-phenetidide and bis-p-chloroanilide, wherein the crude bis-imide is converted to the leuco compound and the latter is oxidized in aqueous suspension (a) in the presence of from 0.2 to 20% by weight, based on the leuco compound, of one or more surfactants or (b) whilst exposed to shearing forces, in the presence or absence of surfactants, at from 20° to 100° C., after which the pigment is isolated.

4,217,456

NITROFURYL QUINALDINIC DERIVATIVES AND PREPARATION THEREOF

Raphael R. G. Haber, and Eva Schöenberger, both of Givatayim, Israel

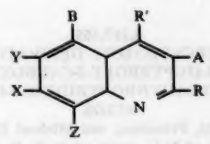
Division of Ser. No. 643,830, Jun. 6, 1967, Pat. No. 4,087,427. This application Apr. 27, 1978, Ser. No. 900,815

Claims priority, application Israel, Jun. 23, 1966, 26022

Int. Cl.[2] G07D *215/48*

U.S. Cl. 546—167 **4 Claims**

1. A quinoline compound of the formula



in which R is hydrogen, 5-nitrofuryl, lower alkyl, acetoxy or hydroxy-methyl, carbonyl or its oxime or one of its hydrazones, or carboxyl, R' is hydrogen, 5-nitrofuryl, acetoxy- or hydroxy-methyl, or carboxyl, X is hydrogen, halogen, hydroxy, acetoxy, carboxyl, lower alkoxy, lower alkyl or amino, Y is hydrogen or alkyl, Z is hydrogen, halogen, nitro, lower

alkyl or amino, A is hydrogen or lower alkyl group, B is hydrogen, nitro or amino, and, wherein one of R and R' is 5-nitrofuryl and at least one of R,R' and X is carboxyl or an ester thereof; and the N-oxide and non-toxic acid addition sales of such compound.

4,217,457

HIGHLY SELECTIVE OXIDIZING PROCESS FOR PREPARING PYRIDIN-CARBOXYLIC ACIDS

Giovanni Ghelli, Savona, Italy, assignor to Luigi Stoppani S.p.A., Milan, Italy

Filed Jul. 14, 1978, Ser. No. 924,619

Claims priority, application Italy, Jul. 18, 1977, 25812 A/77

Int. Cl.[2] C07B *3/00*; C07D *213/79, 213/80*

U.S. Cl. 546—320 **16 Claims**

1. An oxidation process for preparing pyridin-carboxylic acid from alkyl pyridine compounds comprising the steps of:

(A) reacting

(1) a hydrosoluble hexavalent chromium oxidizing compound, with

(2) an alkyl pyridine compound, nucleus substituted by alkyl groups oxidizable to carboxylic groups, connected through a carbon-to-carbon bond, and present in an amount from 30 to 50 percent in excess of the stoichiometric ratio for an reduction reaction,

in the presence of carboxylic acid of the same type as that released in the oxidation reaction and in the same amount as the latter; said reaction being carried out in homogeneous phase in the presence of not less than 40 moles of water per mole of carboxylic acid, at a temperature of from 150° to 300° C., at a pH of from 4.5 to 8.5, at a pressure corresponding to the vapor pressure of the reaction mixture at such a temperature, and for the time required for a complete oxidation from the hexavalent to a trivalent chromium compound under the above conditions, to form a reaction slurry;

(B) distilling the reaction slurry to separate a condensate having a specific gravity of about one, containing the excess of the alkyl pyridine compound relative to the stoichiometric amount, with a remaining residual slurry;

(C) filtering the remaining residual slurry to separate produced chromic hydroxide and a substantially neutral aqueous solution of the sodium salt of the desired pyridincarboxylic acid as a single solute;

(D) recovering pyridin-carboxylic acid of at least 99.5% purity by acidification, filtration and extraction;

(E) recycling such portion of the product thus obtained as the carboxylic acid of step (A) as is required; and

(F) recycling the excess alkyl pyridine compound to step (A).

4,217,458

ACYLMERCAPTOACYL DERIVATIVES OF 4,5-DIHYDRO-1H-PYRROLE-2-CARBOXYLIC ACIDS AND 1,4,5,6-TETRAHYDROPYRIDINE-2-CARBOXYLIC ACIDS

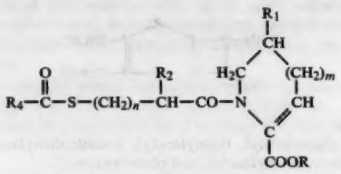
Miguel A. Ondetti, Princeton, and Michael E. Condon, Lawrenceville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 967,827, Dec. 8, 1978. This application Aug. 24, 1979, Ser. No. 69,418

Int. Cl.[2] C07D *213/55, 207/22*

U.S. Cl. 546—326 **8 Claims**

1. A compound of the formula

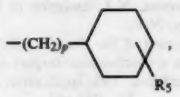


wherein

R and R_2 each is hydrogen or lower alkyl;

R_1 is hydrogen, hydroxy, halogen or lower alkoxy;

R_4 is lower alkyl of 1 to 6 carbons, cycloalkyl of 3 to 7 carbons,



p is zero, one or two;

R_5 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, or halogen;

X is O or S;

m and n each is zero or one;

and physiologically acceptable salts thereof.

4,217,459

BENZYLTHIO-1,3,4-THIADIAZOL-2-YL UREAS

Joel L. Kirkpatrick, Overland Park, Kans., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 827,489, Aug. 25, 1977, Pat. No. 4,141,717, which is a continuation-in-part of Ser. No. 701,262, Jun. 30, 1976, abandoned. This application Oct. 18, 1978, Ser. No. 952,504

The portion of the term of this patent subsequent to Jan. 3, 1995, has been dicclaimed.

Int. Cl.[2] C07D *285/12*

U.S. Cl. 548—140 **5 Claims**

1. 1,3-Dimethyl-3-(5-m-cyanobenzylthio-1,3,4-thiadiazol-2-yl)urea.

4,217,460

ISOLATION OF FORMIC ACID FROM ITS AQUEOUS SOLUTIONS

Heinz Hohenschutz, Mannheim; Johannes E. Schmidt, Ludwigshafen, and Hans Kiefer, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

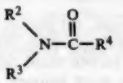
Continuation of Ser. No. 725,845, Sep. 23, 1976, abandoned. This application Apr. 6, 1978, Ser. No. 893,953

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545658

Int. Cl.[2] C07C *51/44, 51/48, 53/02*

U.S. Cl. 562—609 **6 Claims**

1. A process for isolating formic acid from its aqueous solutions which comprises first extracting an aqueous solution of formic acid with a liquid extractant and then distilling the formic acid from the extractant mixture thus obtained, using as said liquid extractant a dialkyl formamide of the formula



wherein:

R^2 and R^3 are alkyl groups of up to 8 carbon atoms with the proviso that the sum of the carbon atoms of R^2 and R^3 is from 7 to 14; and

R^4 is hydrogen.

4,217,461

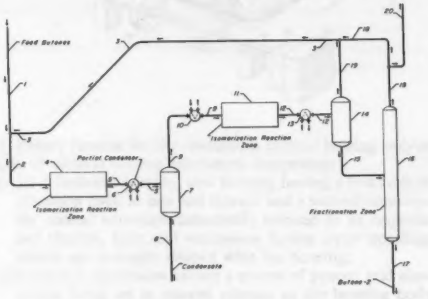
OLEFINIC HYDROCARBON ISOMERIZATION PROCESS

Dennis J. Ward, South Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 26, 1979, Ser. No. 60,714

Int. Cl.[2] **C07C** *5/24, 11/02*

U.S. Cl. 585—668 **8 Claims**



1. In a process for the isomerization of olefinic hydrocarbons having less than eight carbon atoms per molecule wherein a vapor-phase feed stream comprising a first olefinic hydrocarbon and hydrogen is passed through an isomerization reaction zone containing an isomerization catalyst in which zone portion of the first olefinic hydrocarbon is transformed into an isomer of the first olefinic hydrocarbon; a vapor-phase isomerization reaction zone effluent stream is partially condensed to form a recycle gas stream and a liquid-phase hydrocarbon stream containing at least 75 mole percent of the total hydrocarbons in the vapor-phase isomerization zone effluent stream; and the isomer of the first olefinic hydrocarbon is recovered from the liquid-phase hydrocarbon stream as a product; the improvement which comprises:

(a) partially condensing the vapor-phase effluent stream of a first isomerization reaction zone which is operated at a first temperature and then separating a resultant liquid-phase condensate stream which contains less than 25 mole percent of the total hydrocarbons in the vapor-phase effluent stream of the first catalytic isomerization rection zone from the remaining uncondensed portion of the vapor-phase effluent stream of the first catalytic isomerization reaction zone;

(b) heating the remaining uncondensed portion of the vapor-phase effluent stream of the first catalytic isomerization reaction zone;

(c) passing the remaining uncondensed portion of the vapor-phase effluent stream of the first catalytic isomerization reaction zone through a second catalytic isomerization reaction zone operated at a lower second temperature; and,

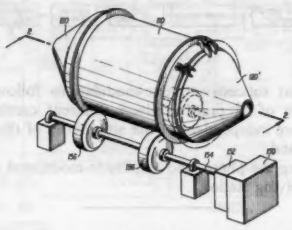
(d) partially condensing the vapor-phase effluent stream of the second catalytic isomerization reaction zone to thereby form the liquid-phase hydrocarbon stream and the recycle gas stream.

4,217,462

ROTARY FURNACE FOR THE FUSION OF MINERAL BEARING SUBSTANCES, APPARATUS AND METHOD

William T. Rawles, 207 Haynes Blvd., Greeneville, Tenn. 37743, and Kenneth Jenkins, Box 50 A, Moshein, Tenn. 37818

Continuation-in-part of Ser. No. 904,441, May 9, 1978, abandoned. This application Apr. 4, 1979, Ser. No. 27,155
Int. Cl.[2] F27B *7/10, 7/32, 7/34*
U.S. Cl. 13—10 5 Claims



1. Rotary furnace for the continuous electric heating and/or fusion of mineral bearing substances comprising:

(A) a cylindrical housing, said housing having a first conical extension fixed to one end thereof and a second removeable conical extension detachably secured to an opposite end thereof, both said extensions having outer openings which are coaxially aligned with the housing;

(B) opposed electrodes having a source of power, said electrodes being set in coaxial relation to the housing body and being removeably sustained, in spaced relation to each other and to the outer openings of the conical extensions; and

(C) means engageable with the exterior of the housing to rotate the furnace.

4,217,463

FAST RESPONSIVE, HIGH PRESSURE THERMOCOUPLE

Saxon B. Swearingen, La Porte, Tex., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,232
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—232 6 Claims

1. A thermocouple assembly for operation in a high pressure environment and providing for a rapid response time to sensed changes in temperature, comprising:

(a) at least one thermocouple having a rapid response time to sensed changes in temperature;

(b) a first protective fitting member having a substantially cylindrical configuration and at least one axial channel extending along the length of the fitting member, said thermocouple being protected by being at least partially positioned within said axial channel, said thermocouple having a temperature sensing end projecting slightly beyond one end of said first fitting member for facilitating it to sense the temperature in the region proximate thereto without being unduly influenced by the temperature of said first fitting member;

(c) a second protective fitting member having a substantially cylindrical configuration and an axial bore formed therein, the distal end of said first fitting member being postioned in said bore, said thermocouple extending through said bore;

(d) and means for sealingly joining said distal end of said first fitting member to said second fitting member within said bore to form a high pressure seal between the first and second fitting members, comprising means for soldering the distal end of said first fitting member within said bore in the second fitting member; and

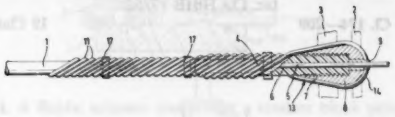
(e) said thermocouple being soldered into said axial channel in proximity to the soldered juncture of said first and second fitting members, said thermocouple being soldered into the axial channel proximate said temperature sensing end of said first fitting member, a portion of the thermocouple extending between the two areas wherein it is soldered into said axial channel so as to be freely movable relative to the axial channel to allow for a difference in thermal expansion between the thermocouple element and said first fitting member.

4,217,464

CABLE ANCHOR

Ronald C. Oldham, Chandlersford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 11, 1978, Ser. No. 941,088
Int. Cl.[2] H02G *15/02*
U.S. Cl. 174—79 1 Claim



1. A cable anchor assembly for anchoring a coaxial cable to a structure comprising:

a tear-shaped anchor cone having a hole through it along its longitudinal axis;

a surface groove extending lengthwise around said anchor cone;

an anchor wire mounted in said groove; and

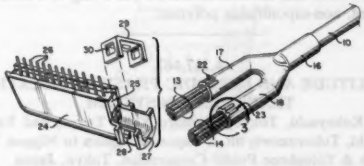
a crush-resistant flexible shroud of insulating material projecting from the more pointed end of said anchor cone, whereby the assembly can be placed over a terminated coaxial cable with the cable passing through said shroud and said anchor cone and secured to the cable with said anchor wire which firmly embraces the cable.

4,217,465

SPLICE BOOT WITH RETENTION MEANS

Paul J. Holden, Pacific Palisades, Calif., assignor to Alta Products Company, Newbury Park, Calif.

Filed Aug. 7, 1978, Ser. No. 931,480
Int. Cl.[2] H01R *13/56, 13/58;* H01B *17/58*
U.S. Cl. 174—138 F 3 Claims



1. A splice boot for covering multiple wire groups extending from the end of a single multiple wire cable for connection to connecting blocks, said boot including:

(a) an entrance tubular portion for receiving all of the multiple wires from the end of said multiple wire cable;

(b) at least two exit tubular portions integrally connected to said entrance tubular portion at first ends to define an integral Y structure so that the multiple wires from the

ends of said multiple wire cable can be divided into at least two wire groups and fed into said entrance tubular portion and out respective second ends of said two exit tubular portions for connection to said connecting blocks; and

(c) retention means integrally formed on the exterior of each of the second ends of said exit tubular portions in the form of longitudinally extending rib means of given width, length and height, said length being at least four times said width, said rib means starting at the exit opening of the exit tubular portion and running longitudinally rearwardly to terminate in a straight end edge normal to the exterior surface of said tubular portion to provide abutting means to retain the exit tubular portion on a connecting block when a clip on the block is positioned over said exit tubular portion immediately to the rear of said rib means to engage said abutting means.

4,217,466

COMPOSITE INSULATORS

Martin Kuhl, Selb, Fed. Rep. of Germany, assignor to Rosenthal Technik AG, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,297

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650363

Int. Cl.[2] H01B *17/02*

U.S. Cl. 174—209 **19 Claims**

1. A composite insulator, comprising a rod with screens surrounding it and an intermediate layer between the rod and the screens in which the rod comprises a non-saponifiable resin reinforced with glass fibers of low alkali content, the screens being of a moisture-repellent, non-saponifiable polymer containing a filler and the intermediate layer being of a moisture-repellent, non-saponifiable polymer.

4,217,467

AMPLITUDE AND PERIODIC PHASE MODULATION TRANSMISSION SYSTEM

Kazuo Kobayashi, Tokyo; Kiyohiro Yuki, Tokyo, and Yutaka Suzuki, Tokorozawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Division of Ser. No. 596,539, Jul. 16, 1975. This application Apr. 12, 1979, Ser. No. 29,502

Claims priority, application Japan, Jul. 19, 1974, 49/83576; Apr. 12, 1975, 50/44999

Int. Cl.[2] H04C *27/24*

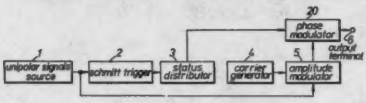
U.S. Cl. 178—67.1 **10 Claims**

10. A method of efficiently transmitting a train of unipolar pulses of varying amplitudes from a transmitting station to a receiving station, and comprising the steps of:

generating a carrier at the transmitting station;

amplitude-modulating the carrier with the train of unipolar pulses;

cyclically phase-modulating the amplitude-modulated carrier at times coinciding with successive unipolar pulses,



such that successive phase-modulations follow a fixed sequence of N predetermined different carrier phases which are independent of the amplitudes of the unipolar pulses; and

transmitting the phase- and amplitude-modulated carrier to the receiving station.

4,217,468

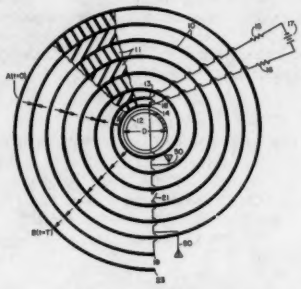
SPIRAL LINE OSCILLATOR

Johnnie W. Rice, Fredericksburg; Ronald J. Gripshover, King George; Millard F. Rose, Dahlgren, and Richard C. Van Wagoner, Great Falls, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 30, 1975, Ser. No. 592,136

Int. Cl.[3] H01Q *1/04*

U.S. Cl. 178—116 **9 Claims**



1. A compact, lightweight RF power source comprising:

a high-voltage, vector-inversion generator including a low impedance switch which when closed initiates vector inversion;

at least one tuned inductor connected to one side of the high voltage output of said generator; and

a high-speed switch interconnecting said inductor and the other side of the high voltage output of said generator for converting said generator and inductor into an RF source when the switch is closed.

4,217,469

CODING AND DECODING APPARATUS FOR THE PROTECTION OF COMMUNICATION SECRECY

Emilio Martelli, 18 Upper Addison Gardens, London W14, England

Filed Mar. 10, 1978, Ser. No. 885,214

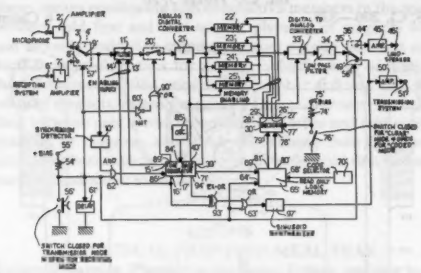
Claims priority, application Switzerland, Mar. 15, 1977, 3222/77; May 25, 1977, 6455/77

Int. Cl.[2] H04K *1/06*

U.S. Cl. 179—1.5 R **42 Claims**

12. Apparatus for the coding and decoding of electrical signals within a pre-established frequency band and useful for providing communication secrecy, which may be connected

between means for the generation and reception of said electrical signals and means for the exchange of said coded signals with at least one other coding and decoding apparatus, comprising a transmission and coding circuit and a reception and decoding circuit for said signals, commutation means for complementarily enabling said transmission and coding circuit and said reception and decoding circuit, said circuits comprising first means for temporarily storing consecutively received



portions of said electrical signals, and second means for enabling the operation of said first means to consecutively store in memory said signal portions and to transmit said signal portions, in a different order, to one of said exchange means and said means for the reception of said signals, including third means for controlling the storage of said electrical signal portions in memory within said first means with a sampling frequency selectable between one of a fixed frequency and two or more frequencies variable in a pre-established order.

4,217,470

IGNITION DISTRIBUTOR WITH NOISE SUPPRESSION ELECTRODES

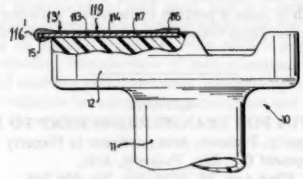
Kuno Kirner, Gerlingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 845,123, Oct. 25, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 915,655

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730416

Int. Cl.[2] H01H *19/00;* **F02P** *1/00;* **C01B** *33/06*

U.S. Cl. 200—19 R **8 Claims**



1. Ignition distributor for an internal combustion engine having

a fixed electrode means including a plurality of fixed electrodes (15, 16) located on the circumference of an imaginary cylindrical surface;

connection means (20) connecting each of said electrodes to a spark plug wire (17', 18') for connection to a respective spark plug (17, 18);

a distributor rotor (10);

a central distributor contact (9, 116) on the rotor;

means (8) connecting said contact to the secondary (7) of a spark coil (4);

and a terminal electrode means (13, 13') on the rotor (10) to provide a connecting spark gap in conjunction with a respective fixed electrode as the electrode means on the rotor rotates past the fixed electrodes,

at least one of the electrode means (13, 13', 15, 16) including in its electrical conduction path a resistance material having a resistance sufficiently high to form a radio interference noise suppression resistance,

wherein, in accordance with the invention,

the resistance material comprises at least one high melting point oxy-nitride of a metal selected from the group III, or IV-B to VI-B transition metals of the periodic table.

4,217,471

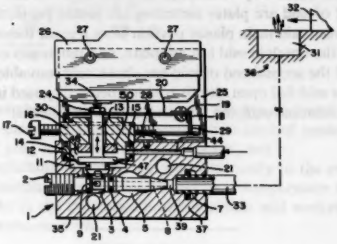
FLUIDIC ACTUATOR FOR A SWITCHING DEVICE

Otmar M. Ulbing, 1274 Lakeshore, Webster, N.Y. 14580

Filed Mar. 17, 1978, Ser. No. 887,824

Int. Cl.[2] H01H *35/40*

U.S. Cl. 200—81.9 R **10 Claims**



1. A fluidic actuator comprising a retainer block provided with fluid inlet and outlet passages and a regulating passage interiorly joining said inlet and outlet passages, adjustable obstruction means for partially obstructing said regulating passage and restricting the flow of fluid from said inlet passage to said outlet passage, a backpressure passage within said obstruction means for receiving fluid backed up into said outlet passage under back-pressure conditions, a sensing chamber within said retainer block and communicating with said backpressure passage, a diaphragm extending across said sensing cavity for movement in response to backpressure fluid from said backpressure passage, and a pusher mounted for actuation by movement of said diaphragm.

4,217,472

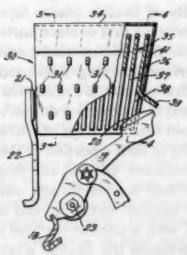
COMPACT CIRCUIT BREAKER HAVING HIGH INTERRUPTING CAPACITY

Carl E. Gryctko, Cherry Hill, N.J.; Bernard DiMarco, Bellefontaine, and Andrew J. Kralik, Marysville, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Nov. 2, 1977, Ser. No. 847,789

Int. Cl.[2] H01H *33/08*

U.S. Cl. 200—144 R **4 Claims**



1. A circuit breaker including a relatively stationary contact, a movable contact engaged with said stationary contact when said circuit breaker is closed, operating means for separating

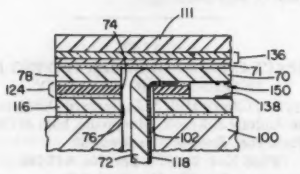
said contacts by moving the movable contact to a full open circuit position, an arc chute to receive and facilitate extinction of electric current arcs drawn between said contacts upon separation thereof, said arc chute including a plurality of arc plates disposed in closely spaced face-to-face relationship to form a stack wherein the first of said plates in said stack is disposed at a first end of a said arc chute and the last of said plates in said stack is disposed at a second end of said arc chute, said stationary contact positioned at said first end, said movable contact when in said full open circuit position is at said second end with at least half of said movable contact extending outside of said arc chute beyond a main planar portion of the last of said arc plates, said plates including said last plate having notches in their forward edges cooperating to form a passage for movement of said movable contact from engagement with said stationary contact to said full open circuit position, the last of said arc plates including tab means projecting at an angle from said main planar portion from a point thereof at the rear of the notch in said last arc plate, said tab means extending beyond the second end of said arc chute, said movable contact when in said full open circuit position being disposed in closely spaced relation with the free end of said tab means.

4,217,473

CONNECTING FLEXIBLE SWITCH

Wayne K. Parkinson, Mequon, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 26, 1978, Ser. No. 919,372
Int. Cl.[2] H01H *3/12, 9/26, 43/08*
U.S. Cl. 200—159 B **4 Claims**



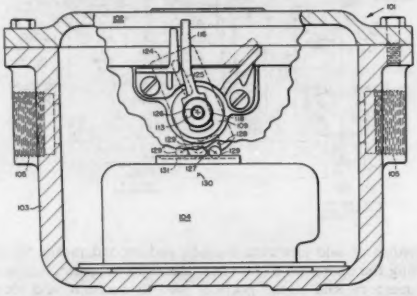
1. In a flexible switch for mounting on an underlying frame, including a plurality of flexible plastic layers, one said layer carrying on one surface a first contact portion and a first conductive lead, means for spacing said contact-carrying layer from a facing surface carrying a second contact portion aligned with said first portion, a flexible tail integral with one said flexible layer and bent downward from said layer at a bend region spaced inward from the edge of said layer, and an insert means for occupying at least a portion of the zone from which said tail is bent downward, said tail carrying on one surface a second conductive lead for electrically connecting said first conductive lead to external circuitry, said second conductive lead being integral with a conductive lead on one said layer, the improvement wherein the flexible layer with which said flexible tail is integral is an upper layer, said tail thereby emanating from above one or more lower layers of said switch and said tail being bent downward through slots in said lower layers.

4,217,474

CAM MEMBER FOR ACTUATING AND/OR RESTRAINING THE MOTION OF A BAIL

Maria Toth, Terryville, and Frederick A. Reker, Burlington, both of Conn., assignors to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 765,463, Feb. 4, 1977, abandoned. This application Jan. 5, 1979, Ser. No. 1,099
Int. Cl.[2] H01H *3/20*
U.S. Cl. 200—335 **6 Claims**



1. A bail actuating member for initiating movement of a bail along a first predetermined arcuate path in a first plane and between first and second limits and comprising in combination:

(a) a cam member supported for arcuate motion in said first plane and having first and second cam surfaces with each cam surface having a first portion which is proximate to the bail when the bail is at either of its first and second limits whereby neither said cam member nor the bail can move when the bail is situated at its first or second limit without simultaneous motion of the other;

(b) said first and second cam surfaces each having second portions which serve to urge and restrict the motion of the bail after it is moved from said first limit and towards said second limit, or after the bail is moved from said second limit and towards said first limit, respectively, in response to motion of said cam member; and wherein

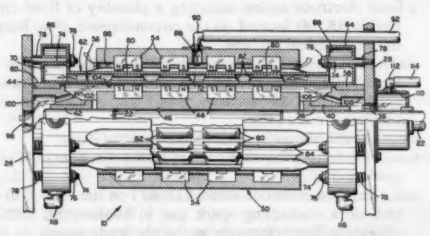
(c) said second portions of said cam surfaces are not both proximate to the bail when the bail is intermediate of said first and second limits whereby the bail is free to move through at least a portion of its travel between said first and second limits without synchronous motion of said cam member.

4,217,475

APPARATUS FOR TRANSFERRING HEAT TO FLUIDS

John P. Hagerty, Prescott, Ariz., assignor to Hagerty Research & Development Co., Inc., Prescott, Ariz.

Filed Aug. 25, 1978, Ser. No. 936,708
Int. Cl.[2] H05B *5/08;* **F01D** *25/08*
U.S. Cl. 219—10.51 **12 Claims**



1. In apparatus for heating a fluid comprising a first plurality

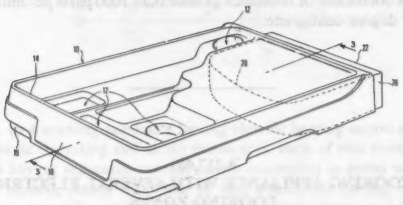
of magnets, means holding said first plurality of magnets in a predetermined pattern, a second plurality of magnets, means holding the second plurality of magnets in a predetermined pattern in spaced relationship with respect to said first plurality of magnets, and means for moving at least one of said plurality magnets relative to the other, the improvement comprising a stationary conductive member of generally cylindrical shape, a second stationary conductive member of generally cylindrical shape, means positioning said conductive members in the space between said first and said second plurality of magnets with said second conductive member located outside said first conductive member, means for passing a first stream of cooling fluid between said first conductive member and said first plurality of magnets, means for passing a second stream of cooling fluid between said second conductive member and said second plurality of magnets, and means for passing fluid from both streams in heat transfer relationship between said first and said second conductive members.

4,217,476

INDIVIDUAL PREPARED MEAL TRAY

Robert Bellavoine, Plombieres-les-Bains, France, assignor to De Pruines ISECO S.A., Plombieres-les-Bains, France

Filed Jan. 9, 1978, Ser. No. 867,999
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **10 Claims**



1. A tray for storing a prepared meal and allowing selective heating of at least one constituent of said meal while avoiding heating of the other constituents of said meal, said tray comprising side walls and a bottom wall made of a nonmetallic material, said bottom wall being provided in a first region with projections and recesses defining compartments for receiving said other constituents of said meal, and in a second region with a metallic compartment housed inside said tray and closed except for an opening accessible from outside said tray, said opening enabling introduction of said constituent to be reheated and enabling communication insulated against electromagnetic radiation between said compartment and an external source of electromagnetic waves.

4,217,477

FOOD TEMPERATURE CONTROL IN A MICROWAVE OVEN

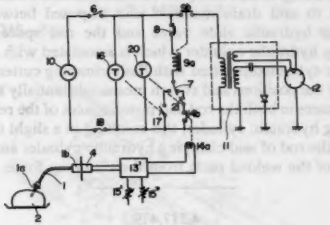
Sigeo Matsubara, Hiranohonmachi, and Tatsuya Tsuda, Osaka, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1977, Ser. No. 856,098
Claims priority, application Japan, Nov. 30, 1976, 51-146024; Dec. 15, 1976, 51-153154
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 B **7 Claims**

1. A microwave oven including a food temperature sensing probe and a microwave generation control circuit for controlling the microwave generation from a magnetron in a cook time period control mode wherein a time period is controlled during which the microwave generation is conducted and in a food temperature control mode wherein a food temperature being cooked is controlled, said microwave generation control circuit comprising:

a mode selection circuit for selecting one of said two operation modes;

a food temperature sensing probe including a plug, and a switching means operatively positioned adjacent to a socket secured by a wall of said microwave oven, said socket being adapted to removably retain said plug;



said switching means automatically placing said mode selection circuit in said food temperature control mode when said plug is inserted into said socket; and

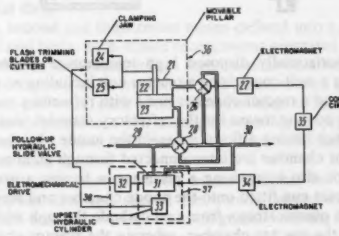
said switching means being responsive only to the one step positioning of said plug of said food temperature sensing probe in the operative position within said socket in the microwave oven.

4,217,478

DEVICE FOR CONTROLLING BUTT WELDING MACHINE

Sergei I. Kuchuk-Yatsenko, Ulitsa Filatova 1/22, Kv. 47; Valery G. Krivenko, Ulitsa Ordzhonikidze 3, Kv. 35, and Ivan K. Golomovzjuk, Ulitsa Vetryanaya 28, Kv. 1, all of Kiev, U.S.S.R.

Continuation-in-part of Ser. No. 714,173, Aug. 13, 1977, abandoned. This application Nov. 27, 1978, Ser. No. 963,827
Claims priority, application U.S.S.R., Oct. 8, 1975, 2178895
Int. Cl.² B23K 11/04
U.S. Cl. 219—97 **10 Claims**



1. In a butt welding machine of the type having two pairs of plier or scissor-type clamps and upset hydraulic cylinders coupled with said plier-type clamps, each of said two pairs of plier-type clamps having a hydraulic cylinder for clamping machine jaws against parts to be welded, a hydraulic fluid supply system with delivery and drain manifolds connected to the spaces of a reversing hydraulic slide valve for simultaneously controlling the clamping and unclamping of both welded parts by controlling the hydraulic pressures within the spaces of said clamping hydraulic cylinders, a follow-up hydraulic slide valve connected to said manifolds and to said upset hydraulic cylinders and controlling coupling between said upset hydraulic cylinders and said manifolds to thereby control said upset hydraulic cylinders, and an electromechanical drive coupled to said follow-up hydraulic slide valve for actuating the same and thereby actuating said upset hydraulic

cylinders during the welding process, said electromechanical drive, said follow-up hydraulic slide valve and said upset hydraulic cylinders together forming an electrohydraulic transfer drive; a device for flash trimming, following upset, comprising flash trimming cutters mounted on one of said pairs of said plier-type clamps to thereby move jointly therewith, and means for controlling the machine following upset and during flash trimming which comprises a multiposition switch means coupled to said drain manifold and disposed between said reversing hydraulic slide valve and the rod space of that clamping hydraulic cylinder which is associated with a pair of said plier-type clamps fitted with flash trimming cutters so that in one of the positions said switch means substantially equalizes the pressures in both the rod and piston spaces of the respective clamping hydraulic cylinder, this resulting in a slight displacement of the rod of said clamping hydraulic cylinder and relieving one of the welded parts from the clamping force.

4,217,479

HIGH TEMPERATURE REACTOR

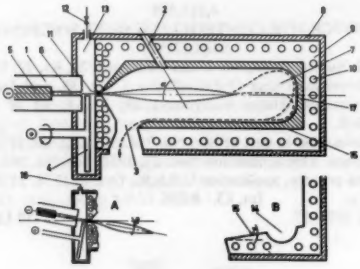
Werner J. Borer, Flurlingen; Volker Nobbe, Neuhausen am Rheinfall, and Hugo Spalinger, Schaffhausen, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 6, 1978, Ser. No. 893,898

Claims priority, application Switzerland, Apr. 29, 1977, 5351/77; Fed. Rep. of Germany, Jun. 28, 1977, 2729188

Int. Cl.[2] B23R *9/00*; H05B *7/10*

U.S. Cl. 219—121 P **12 Claims**



1. A horizontally disposed high temperature reactor for producing a melt comprising a reactor unit including an anode chamber and a reactor chamber lined with refractory material overlying cooling means for the refractory material, said reactor chamber having a floor, wherein the anode chamber and the reactor chamber are interconnected through an inlet port, the reactor also comprising a plsama gun having a graphite cathode, said gun fitted onto the anode chamber and arranged to direct a plasma stream from said cathode through said inlet port into the reactor chamber, wherein the reactor chamber includes a main axis horizontally disposed relative to said reactor floor and includes a feed port for feeding material into the reactor chamber, a reactor wall opposite said plasma stream vertically disposed relative to said reactor floor, said reactor floor extending from said reactor wall, and an exit port in the floor of the reactor chamber for tapping off the melt produced from the material fed into the reactor chamber, the feed port being disposed at an angle of up to 90° with respect to said main axis in the direction of the plasma stream for feeding material into said stream to be melted thereby and to be thrown against the reactor wall thereby and to flow on said floor towards said exit port, and the exit port being positioned adjacent said inlet port of the plasma stream whereby outflowing melt is kept at a sufficiently high temperature by said adjacent plasma stream to prevent solidification, wherein the feed port is situated above the plasma gun and the exit port is situated below the plasma gun.

4,217,480

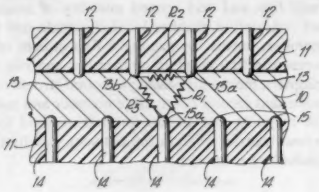
THERMAL PRINT BAR

Frederick C. Livermore, Kanata, and Robert J. Boynton, Ottawa, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 5, 1978, Ser. No. 939,352

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **4 Claims**



1. A thermal print bar comprising an elongate strip of resistive material deposited on a substrate material, said strip having a pair of edges, a plurality of conductors deposited on the substrate material and connecting contact areas along both edges of the resistive materials to terminals, wherein the resistive material has, in an operating regime, a negative temperature coefficient of resistance greater than 1000 parts per million per degree centigrade.

4,217,481

COOKING APPLIANCE WITH SEVERAL ELECTRIC COOKING ZONES

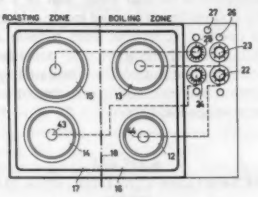
Karl Fischer, Am Gaensberg 23, 7519 Oberderdingen, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,747

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739760

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—450 **4 Claims**



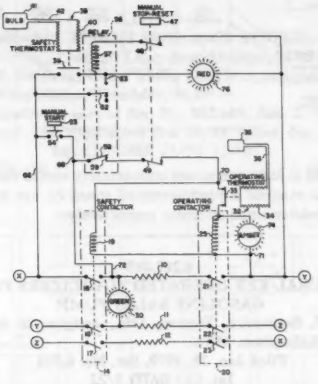
1. A surface-unit cooking appliance comprising a plurality of electric hot plates of the same type, each of the hot plates having a temperature regulator and each of the regulators having a temperature sensor for sensing the temperature of a cooking vessel or a product being cooked, at least one of the hot plates being disposed in each of first and second surface cooking zones, the first zone being designed for boiling water-containing media, the at least one temperature regulator in the first zone being designed and constructed with a temperature control range limited to a maximum temperature of 150° C. at the temperature sensor, and the second zone being designed for roasting, the at least one temperature regulator in the second zone being designed and constructed with a temperature control range limited to a maximum temperature above 220° C. at the temperature sensor.

4,217,482

ELECTRIC COOKING APPARATUS WITH SAFETY CONTROL

Gurinder S. Wadia, Harwood Heights, Ill., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 16, 1977, Ser. No. 797,060
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—494 10 Claims



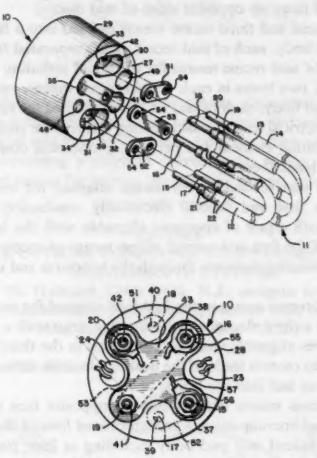
1. In a cooking appliance having electric heating means and separate operating and safety contactors, each of said contactors having separable contact means connected in series with the heating means and each of said contactors having coil means that when energized close the contact means, and further having an operating thermostat effective with the operating contactor to cycle the heating means on and off to maintain the desired cooking temperature and further having a safety thermostat effective with the safety contactor to render the appliance inoperable in the event of a malfunctioning overheat condition, and further having a manual start actuator having normally open contact means and stop and reset actuators having normally closed contact means, the improvement comprising the combination of a control having a normally open contact means and a normally closed contact means and an actuating coil that when energized shifts and holds the said contact means to and in the closed and open conditions respectively, a first circuit including the start actuator and the normally closed contact means of the control, said first circuit being operable to energize the safety contactor coil means and initially close the contact means of the safety contactor upon momentary closure of the normally open start actuator contact means; a second circuit including the initially closed contact means of the safety contactor, the normally closed contact means of the control, and the normally closed contact means of the stop actuator, said second circuit being operable to maintain the safety contactor coil energized through the closed contact means of the safety contactor upon the initial closure of said safety contactor contact means by said first circuit; a third circuit including the safety thermostat contact means operable to energize the coil of the control and open the normally closed contact means of the control in said second circuit and deenergize the safety contactor coil to open the safety contactor contact means, said coil also closing the normally open contact means of the control; and a fourth circuit including the closed normally open contact means of the control and the normally closed contact means of the reset actuator operable to maintain the coil of the control energized.

4,217,483

TERMINAL BLOCK FOR SINGLE PHASE OR THREE PHASE WIRING OF AN IMMERSION HEATER ASSEMBLY AND METHODS OF WIRING

Alan D. Vogel, Laurel, Md., and Fred E. Snyder, Princeton, N.J., assignors to Electro-Therm, Inc., Laurel, Md.

Continuation-in-part of Ser. No. 735,864, Oct. 27, 1976, abandoned. This application Jul. 21, 1978, Ser. No. 926,793
Int. Cl.[2] H05B *3/82*
U.S. Cl. 219—541 14 Claims



1. A terminal block for either single phase or three phase wiring of an electrical immersion heater assembly consisting of three separate heating elements each with a pair of electrical leads, said terminal block comprising:

an electrically insulating body defining a disc of substantial axial dimensions with a pair of faces on opposite sides of said disc;

first, second and third recess means defined into a first face of said body, each of said recess means separated from the other of said recess means for electrical isolation;

six bores, two bores in each of said recess means, extending into said body, each of said six bores adapted for receiving one electrical lead of a heating element for supporting said heating element and permitting electrical connection to the leads thereof;

said first and second recess means adapted for receiving therein first and second electrically conductive means each with a pair of apertures alignable with the two bores in each of the first and second recess means to receive leads of the heating elements through the apertures and into the bores;

said third recess means in the first face adapted for three phase wiring of said heating elements by receiving a third electrically conductive means with a pair of apertures alignable with the two bores in the third recess means to receive leads of the heating elements through the apertures and into the bores; and

fourth recess means defined into an opposite face of said body, said fourth recess means encompassing only a predetermined four of the six bores, including at least one bore from each of said first, second, and third recess means, and adapted for single phase wiring of said heating elements by receiving fourth and fifth electrically conductive means each with a pair of apertures, the apertures of said fourth and fifth conductive means each being alignable with bores in said fourth recess means for electrical

connection to leads of the heating elements inserted through said four bores.

12. A method of mounting and wiring a heating assembly in a terminal block with a plurality of electrically conductive straps for application of a three phase power source to said heater assembly;

said heater assembly including three separate heating elements, each heating element having a pair of leads in a parallel and spaced apart relationship;

said terminal block comprising an electrically insulating body defining a disc of substantial axial dimension with a pair of faces on opposite sides of said disc;

first, second and third recess means defined into a first face of said body, each of said recess means separated from the other of said recess means for electrical isolation;

six bores, two bores in each of said recess means, extending into said body, each of said six bores adapted for receiving one electrical lead of a said heating element for supporting said heating element and permitting electrical connection to the leads thereof;

said first and second recess means adapted for receiving therein first and second electrically conductive straps each with a pair of apertures alignable with the bores in each of the first and second recess means to receive leads of the heating elements through the apertures and into the bores;

said third recess means in the first face adapted for receiving therein a third electrically conductive strap with a pair of apertures alignable with the two bores in the third recess means to receive leads of the heating elements through the apertures and into the bores; and

fourth recess means defined into an opposite face of said body and encompassing a predetermined four of the bores which extend into said body including at least one bore from each of said first, second, and third recess means,

said method including the steps of:

inserting said conductive straps into said first, second and third recess means of said terminal block such that apertures in said straps are substantially in alignment with said bores; and

inserting leads of each heating element through the apertures in said straps and into the bores of said terminal block such that said heating elements are in a substantially parallel and spaced apart relationship with no two leads of a single heating element inserted through the same strap.

13. The method as defined in claim 12 further comprising the additional steps of extending the heating element leads in four of said terminal block bores into said fourth recess means, and, threadedly securing the leads of said heating elements which extend into said fourth recess means in the opposite face of said terminal block.

4,217,484

TAXIMETER

William J. Gerst, 3265 Dodd La., Eagan, Minn. 55121

Continuation of Ser. No. 761,873, Feb. 7, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 871,440

Int. Cl.[2] G07B *13/10*

U.S. Cl. 235—92 DN **39 Claims**

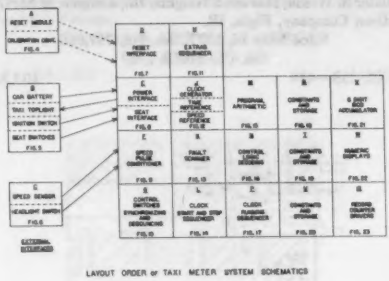
1. In a taximeter for use in a taxi

a. occupancy-sensing means to detect a passenger,

b. speed-sensing means to measure speed of a taxi and including clock means and distance-sensing means sensing distances traveled by the taxi,

c. logic means responsive to the occupancy-sensing means and to at least one of the speed-sensing means and distance-sensing means for starting the meter when

1. a passenger is detected by the occupancy-sensing means, and



LAYOUT ORDER OF TAXI METER SYSTEM SCHEMATICS

2. said at least one means concurrently senses that the taxi has reached a predetermined speed or has traveled a predetermined distance, respectively.

4,217,485

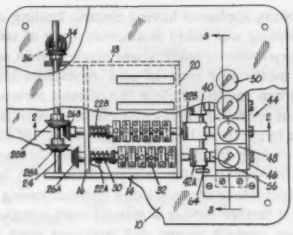
PLURAL KEY OPERATED TOTALIZERS FOR GASOLINE SALES PUMP

Eugene F. Settlemire, Tucson, Ariz., assignor to Austin A. Webb, Kalamazoo, Mich.

Filed Jan. 25, 1979, Ser. No. 6,534

Int. Cl.[2] B67D *5/22*

U.S. Cl. 235—94 R **5 Claims**



1. In combination with a gasoline sales pump having an electrically actuated delivery device which delivers through a flow meter driving the meter, and a resettable sales register having a manually operable lever arranged to actuate said delivery device between on and off positions and to zero the register only when the lever has been returned to off position,

plural non-resettable accumulation registers comprising a common drive shaft having plural gears and being connected to be driven by said sales register,

plural register shafts each having a drive gear axially movable to engage a different gear on said common shaft,

plural key operated locks having axially shiftable cylinders and spring biased selector bars with laterally extending arms each arranged to shift one of said gears on one of said register shafts into engagement with said common shaft,

slidable detent bars mounted in crossing relation to said selector bars and spring biased oppositely, said detent bars having oppositely inclined cam slots therein,

pins on said selector bars engagable with said cam slots,

an electric switch having an actuating element positioned to be moved to closed position by movement of a first one of said detent bars against its spring bias as a control detent,

a second one of said detent bars having retaining notches arranged to receive the pin of a first actuated selector bar as a release detent,

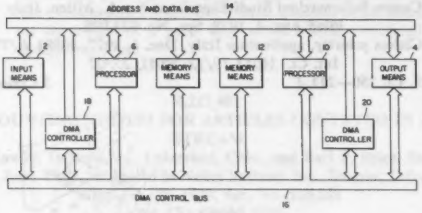
said first control detent having blocking notches engagable with the pins on all but the first actuated selector slide,
a release shaft connected to the reset mechanism of said register,
and a lever on said last shaft arranged to move said second release detent against its spring bias and release the pin of the first actuated selector slide when said register reset mechanism is actuated,
said electric switch being connected in series with said electrically actuated delivery device of said sales pump.

4,217,486

DIGITAL FLIGHT GUIDANCE SYSTEM

David A. Tawfik, Woodcliff Lake; Jerry Doniger, Montvale, and Donald J. Porawski, Cedar Grove, all of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

Continuation-in-part of Ser. No. 802,685, Jun. 2, 1977, abandoned. This application Jan. 31, 1979, Ser. No. 8,132
Int. Cl.[2] G06F *15/50, 11/08*
U.S. Cl. 371—68 **10 Claims**



1. A digital system for guiding the flight of an aircraft, comprising:
a pair of processors;
a pair of memory means, each of which is associated with a corresponding processor;
system input means commonly associated with the processors and their corresponding memory means;
means for sensing outer loop flight guidance conditions;
means for sensing inner loop flight guidance conditions;
the system input means connected to the outer loop condition sensing means and responsive to the sensed conditions therefrom for providing an outer loop condition output, and connected to the inner loop condition sensing means and responsive to the sensed conditions therefrom for providing an inner loop condition output;
one of the processors and its associated memory means connected to the input means, said associated memory means including means responsive to the outer loop condition output and means responsive to the inner loop condition output for providing a first system output for outer loop and inner loop guidance of the flight of the aircraft; and
the other of the processors and its associated memory means connected to the input means, said associated memory means including means responsive to the inner loop condition output for providing a second system output for inner loop guidance of the flight of the aircraft.

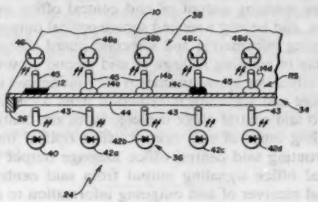
4,217,487

SELF-CALIBRATING APPARATUS FOR PHOTOELECTRICALLY SCANNING ANSWER DOCUMENTS

Clayton P. Kjeer, Shakopee, Minn., assignor to National Computer Systems, Inc., Minneapolis, Minn.

Filed May 26, 1978, Ser. No. 909,619
Int. Cl.[2] G06K *7/10*; G09B *27/06*
U.S. Cl. 235—468 **18 Claims**

1. Apparatus for photoelectrically scanning a document having rows of response positions printed thereon comprising means for photoelectrically scanning said rows and the unprinted areas therebetween, first means associated with said scanning means for storing the darkest data derived from the scanning of each row of response positions, said darkest data



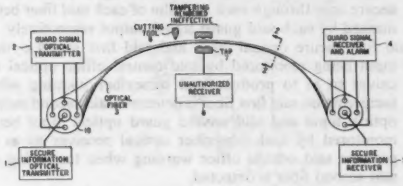
representing a response, second means associated with said scanning means for storing the lightest data derived from the scanning of said unprinted areas in between rows, said lightest data representing a physical characteristic of the document, and third means for storing the average of said lightest data.

4,217,488

SECURE OPTICAL COMMUNICATION COMPONENTS, METHOD, AND SYSTEM

William M. Hubbard, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1977, Ser. No. 761,283
Int. Cl.[2] H04B *9/00*
U.S. Cl. 455—612 **13 Claims**



1. A secure subscriber loop optical communications system comprising:
subscriber station set means for sending outgoing message and signaling information and receiving incoming message and signaling information;
subscriber optical transmitter means having a message input, a signaling input, and a central office warning input and having a first secure optical output incorporating said outgoing information, and a first guard optical output for masking leakage of said first secure output;
subscriber optical receiver means having a second secure optical input for said incoming information, and a second guard optical input, and having a message output, a signaling output, a subscriber alarm output and a central office warning output communicating to said central office warning input of said subscriber optical transmitter;
subscriber system security status indication means responsive to said subscriber alarm output;
station set line apparatus means for routing said outgoing message and signaling information from said station set to said message input and signaling input of said subscriber optical transmitter and routing said message output and said signaling output from said subscriber optical receiver as said incoming information to said station set;
central office optical receiver means having a first secure optical input and a first guard optical input and having a central office message output, a central office signaling output, a subscriber warning output, and a central office alarm output;

central office alarm indicator means responsive to said central office alarm output;

central office optical transmitter means having a central office message input, a central office signaling input, and a subscriber warning input communicating with said subscriber warning output of said central office optical receiver, and having a second secure optical output for said incoming information and a second guard optical output capable of masking leakage of said second secure output;

central office line apparatus means for routing said incoming message and signaling information from a central office line to said central office message input and central office signaling input of said central office optical transmitter and routing said central office message output and said central office signaling output from said central office optical receiver of said outgoing information to said central office line; and

optical link means comprising first and second optical fiber transmission lines each having at least two cores encased in a cladding, including a central core surrounded by an opaque film in said cladding and also including at least one guard core exterior to said film;

said central core and said guard core or cores of said first fiber connecting said first secure optical output and first guard optical output of said subscriber optical transmitter respectively to said first secure optical input and said first guard optical input of said central office optical receiver,

said central core and guard core or cores of said second fiber connecting said second secure optical output and said second guard optical output of said central office optical transmitter respectively to said second secure optical input and said second guard optical input of said subscriber optical receiver, any said leakage from each said secure core through each said film of each said fiber being masked by each said guard signal output respectively;

said first secure optical input and said first guard optical input being monitored by said central office optical receiver so as to produce said subscriber warning when tampering on said first fiber is detected, said second secure optical input and said second guard optical input being monitored by said subscriber optical receiver so as to produce said central office warning when tampering on said second fiber is detected;

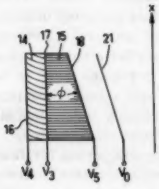
whereby a more secure subscriber loop is achieved.

4,217,489

DEVICE FOR LOCATION-SENSITIVE DETECTION OF PHOTON AND/OR PARTICLE RADIATION

Jean-Claude Rosier, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 918,842
Claims priority, application France, Aug. 5, 1977, 77 24189
Int. Cl.² H01J *39/12*
U.S. Cl. 250—207 **19 Claims**



1. A device for detecting and localizing electrons comprising, in combination:

a first microchannel plate having parallel input and output surfaces;

a second microchannel plate having a flat input surface disposed adjacent the output surface of the first plate and an output surface, the diameter of microchannels in the first plate being smaller than the diameter of microchannels in the second plate;

means for collecting and measuring electric charge produced at the output surface of the second plate;

means which apply electric potentials to the surfaces of the plates which function to produce an electric field which is directed from the input surface of the first plate to the means for collecting and measuring, to operate microchannels in the first plate in the saturation mode for multiplication of a single electron, and to locally operate microchannels in the second plate in the zone saturation mode during multiplication of the charge produced by single electron multiplication in the first plate; and

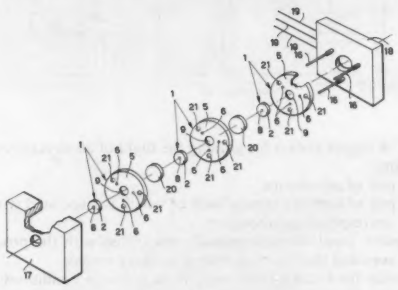
means which cause the gain of the second plate to vary as a function of position on the second plate.

4,217,490

METHOD FOR CONSTRUCTING MULTISPECTRAL INFRARED DETECTORS

Giancarlo Florito, Albenga; Guido Gasparrini, Treviglio, and Francesco Svelto, Segrate, all of Italy, assignors to CISE - Centro Informazioni Studi Esperienze S.p.A., Milan, Italy

Filed Aug. 4, 1978, Ser. No. 931,088
Claims priority, application Italy, Dec. 6, 1977, 30501 A/77
Int. Cl.² H01J *39/12*; H01L *25/02*
U.S. Cl. 250—211 J **3 Claims**



1. A method for constructing multispectral infrared detectors by forming three photovoltaic HgCdTe elements by the mercury ion grafting technique and superimposing said photovoltaic elements to form a sandwich, and comprising the following succession of operations:

(a) preparing, for each of said photovoltaic elements, a slice of HgCdTe having a composition depending on the necessary cut-off wavelength, and a thickness such that it is mechanically self-supporting after operation (c) (e.g. 300–400μ);

(b) polishing both faces of each slice with a diamond paste of progressively decreasing grain size;

(c) chemically attacking the polished slices with bromine (20%)-methanol for five minutes in order to eliminate mechanical damage;

(d) heating each slice in the presence of mercury at controlled pressure inside a previously evacuated test tube to define the type of conductivity and the most suitable concentration of the carriers, said heating being carried out in a furnace with a temperature profile such as to enable the slice to be mantained at 400° C. and the mercury at 280° C. for more than ten hours;

(e) constructing the earth contact by catalytic deposition of gold on one face of each slice in accordance with a geometrical arrangement in the form of a circular ring, by using low temperature photolithographic techniques (less than 40° C.);

(f) cementing the individual slices on to respective supports by means of an electrically conducting paste;

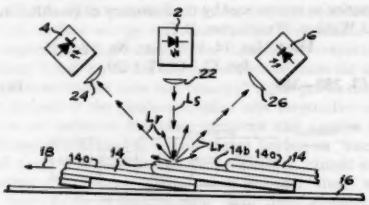
(g) depositing a layer of photoresistive material on the entire free face of each slice;
(h) masking said photoresistive layer with the exception of a small exposure region, the dimensions of which vary according to the application scheduled for the detector, and in particular according to the aperture of the inlet optical system of the instrument for which the detector is intended;
(i) eliminating the photoresistive layer in the exposure and development region without exceeding 40° C. during the various stages;
(j) subjecting each slice to grafting under the following conditions: Hg^+ ions; E=30 Kev; dose 10^{12} ions/cm^2;
(k) depositing the upper contact on to each slice by evaporation of indium through a metal mask;
(l) depositing on to said upper contact and on to the grafted region of each slice, an antireflecting layer of ZnS having a thickness compatible with the cut-off wavelengths of the individual photovoltaic elements, and leaving only a region of said upper contact uncovered;
(m) assembling the individual elements constructed in this manner in overlying disposition, making the electrical connection between the upper contact of each photovoltaic element and a respective output terminal of the detector by means of a gold wire welded with electrically conducting paste.

4,217,491

COUNTING SYSTEM FOR ARTICLES CONVEYED IN A STREAM

Max H. Dufford, Jr., Lakewood, Colo., and Earl T. Price, San Jose, Calif., assignors to Nolan Systems Inc., Denver, Colo.

Filed Jun. 29, 1978, Ser. No. 920,548
Int. Cl.[2] G06M *7/06*
U.S. Cl. 250—223 R **12 Claims**



1. An electro-optical sensing means for detecting articles moved therepast in a path, each of said articles defining a surface of characteristics which reflect light at all angles from incident light projected on the surface, each of said articles also having an edge or the like defining an abrupt step-like formation extending from the surface of said article, said electro-optical sensing means comprising, in combination:

light transmitting means emitting light toward said articles and projecting an incident spot of light on the surface of each article as each article moves past;

first and second light receiving means positioned respectively on the upstream and downstream sides of said spot of light and directed at predetermined angles toward the spot of light on the surface of each said article, the predetermined angles of direction of each said first and second light receiving means causing said light receiving means to each receive incident light from said light transmitting means reflected from the spot due to the reflective characteristics of the article surface, the predetermined angle of one said light receiving means further being determined in relation to the amount of extension of the step-like formation from the article surface in order to result in substantial blocking of the light reflected from the spot on the said one light receiving means by the step-like formation upon movement of said step-like formation into a predetermined position relative to said projected spot, said first and second light receiving means each producing an output signal of magnitude related to the amount of emitted light received by each respective light receiving means as reflection from the spot; and

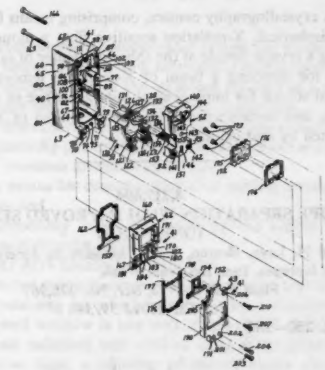
means for receiving the output signals from said light receiving means, and for comparing said output signals and for providing a detection signal when a characteristic of one of said output signals differs from a characteristic of the other of said output signals to indicate movement of the step-like formation into said predetermined position relative to said projected spot at which light characteristically reflected to said one light receiving means is substantially blocked.

4,217,492

MODULAR PHOTOELECTRIC SWITCH

Robert W. Fayfield, Excelsior, Minn., assignor to Banner Engineering Corp., Minneapolis, Minn.

Filed Jul. 17, 1978, Ser. No. 925,163
Int. Cl.[2] H01R *3/06*
U.S. Cl. 250—239 **6 Claims**



1. A modular electrical circuit comprising, in combination:

a power circuit module including a first plurality of connector sockets arranged as elements of a predetermined pattern, said module being adapted to supply an operating voltage and to accept an output signal at selected ones of said sockets;

a sensor circuit module including a second plurality of connector sockets arranged as elements of an identical predetermined pattern, said module being adapted to accept an operating voltage, and to generate a condition-responsive control signal, at selected ones of said sockets;

means mounting said modules so that said patterns are in spaced, aligned relation;

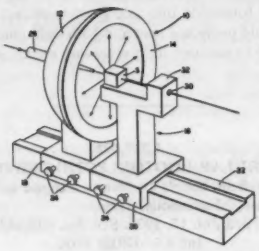
and a logic circuit module including a plurality of connector pins arranged as elements of a pattern identical with said predetermined pattern, said logic module being adapted to accept a control signal, and to supply an output signal, at selected ones of said pins,

said pins being of length sufficiently greater than the space between said power circuit module and said sensor circuit module to enable their simultaneous engagement with sockets of both said modules, whereby to make electrical interconnections among all said modules in accordance with the location of said selected ones of said sockets and said pins, so that said operating voltage is supplied to said sensor circuit module, said control signal is supplied to said logic circuit module, and said output signal is supplied to said power circuit module.

4,217,493
HEMISPHERICAL LAUE CAMERA

James C. M. Li, Pittsford, and Sungnee G. Chu, Rochester, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 4, 1979, Ser. No. 45,543
Int. Cl.[2] G01N *23/20*
U.S. Cl. 250—272 13 Claims

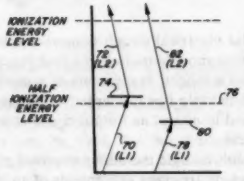


1. A crystallography camera, comprising means for holding a hemispherical, X-radiation sensitive film, a mount for supporting a crystal sample at the spherical center of said film and means for directing a beam of X-radiation generated by an external source for impingement onto a surface of the crystal sample, said hemispherical film being exposed to X-radiation diffracted by said crystal sample.

4,217,494
ISOTOPE SEPARATION WITH IMPROVED SELECTIVE IONIZATION

Richard H. Levy, Boston, Mass., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Feb. 2, 1973, Ser. No. 328,967
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—282 27 Claims



1. In a technique for isotopically selective ionization, a method for selectively exciting an isotope in an environment containing plural isotopes, said exciting method including the steps of:

applying to said plural isotopes in said environment a first radiant energy;

providing a photon energy for said first radiant energy which is less than half of the energy of ionization of said isotopes in an unexcited state to produce an energy step for said one isotope to a first excited energy state;

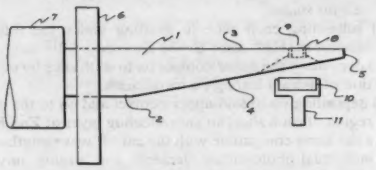
applying to said plural isotopes in said environment a second radiant energy to produce at least excitation of said one isotope in a further energy step to a second excited energy state; and

providing a photon energy for said second radiant energy which is less than half the ionization energy of said plural isotopes thereby necessitating at least three energy steps to ionize the particles of said plural isotopes.

4,217,495
ELECTRON MICROSCOPE BACKSCATTERED ELECTRON DETECTORS

Vivian N. E. Robinson, 112 Oyster Bay Rd., Oyster Bay, New South Wales 2225, Australia

Filed Apr. 4, 1979, Ser. No. 27,066
Claims priority, application Australia, Apr. 18, 1978, PD4084
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—310 11 Claims

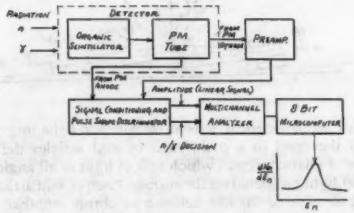


1. A backscattered electron detector for use in an electron microscope, said detector comprising an arm of scintillation material adapted to be coupled to a photomultiplier at one end thereof and incorporating adjacent the opposite end a transverse hole capable of passing the electron beam of said microscope therethrough, said hole having a liner of metallic material capable of being connected to an electrical connection in use.

4,217,496
PORTABLE INSTRUMENT FOR MEASURING NEUTRON ENERGY SPECTRA AND NEUTRON DOSE IN A MIXED N-γ FIELD

Charles J. Daniels, Gaithersburg, and Jeffrey L. Silberberg, Beltsville, both of Md., assignors to The United States of America as represented by the Secretary of Health, Education and Welfare, Washington, D.C.

Filed Mar. 14, 1978, Ser. No. 886,465
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—369 14 Claims



1. A neutron spectrometer system comprising a photomultiplier tube, radiant energy-responsive scintillator means optically coupled to said photomultiplier tube and respectively generating signal pulses at the anode of the photomultiplier tube and at a dynode of the photomultiplier tube responsive to the reception of radiation including neutrons and gamma rays, pulse shape discrimination circuit means having an energy channel portion and a time channel portion, circuit means connecting said dynode and anode respectively to said energy and time channel portions and having means to analyze the signal pulses and distinguish between pulses induced by neutrons and gamma rays, multichannel analyzer means, means to selectively connect said energy channel portion or said time channel portion to said multichannel analyzer means for selecting pulses according to their amplitudes, said multichannel analyzer means including a first group of channels for neutron-derived pulses and a second group of channels for gamma ray-derived pulses, means to sort the neutron-derived pulses into the first group and the gamma-derived pulses into the

second group, means to store the neutron-derived pulses in said first group of channels in a distribution according to their pulse heights, means to store the gamma ray-derived pulses in said second group of channels in a distribution according to their pulse heights, and computer means to convert the pulse height distribution in said first group into a neutron energy spectrum, the storage means including a large area RAM and means to copy the pulse height distributions accumulated in the multichannel analyzer means into said large area RAM using direct memory access.

4,217,497

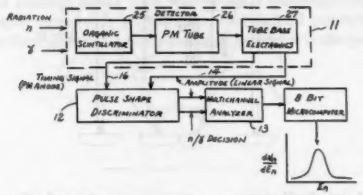
PORTABLE INSTRUMENT FOR MEASURING NEUTRON ENERGY SPECTRA AND NEUTRON DOSE IN A MIXED N-γ FIELD

Charles J. Daniels, Gaithersburg, and Jeffrey L. Silberberg, Rockville, both of Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 886,465, Mar. 14, 1978. This application Jun. 16, 1978, Ser. No. 916,209

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—369 **18 Claims**



1. A neutron spectrometer system comprising a photomultiplier tube, radiant energy-responsive scintillator means optically coupled to said photomultiplier tube, means respectively generating "time" signal current pulses derived from the anode of the photomultiplier tube and "energy" signal pulses derived from a dynode of the photo-multiplier tube responsive to the reception of radiation including neutrons and gamma rays, pulse shape discrimination circuit means having an "energy" channel portion and a "time" channel portion, circuit means connecting said "energy" signal pulses and said "time" signal pulses respectively to said "energy" and "time" channel portions and having means to analyze the signal pulses and distinguish between pulses induced by neutrons and gamma rays, multichannel analyzer means, means to selectively connect said "energy" channel portion or said "time" channel portion to said multichannel analyzer means for selecting pulses according to their amplitudes, said multichannel analyzer means including a first group of channels for neutron-derived pulses and a second group of channels for gamma ray-derived pulses, means to sort the neutron-derived pulses into the first group and the gamma ray-derived pulses into the second group, means to store the neutron-derived pulses in said first group in a distribution according to their pulse heights, means to store the gamma ray-derived pulses in said second group of channels in a distribution according to their pulse heights, and microcomputer means to convert the pulse height distribution in said first group into a neutron energy spectrum, the storage means including a RAM, the multichannel analyzer means including an A/D converter for channel encoding, and means to correct for differential nonlinearity of the A/D converter comprising an auxiliary counter, means to increment said auxiliary counter each time data is stored in the RAM, D/A means to convert the counts in said auxiliary counter to a correction analog voltage, means to add this correction voltage to the pulse discrimination circuit means "energy" channel output to provide a resultant analog signal, A/D means to convert said resultant analog signal to a resultant digital code, means to subtract the counts of the auxiliary counter from said resultant digital code to derive a corrected resultant code, and means to address said corrected resultant code to said RAM.

4,217,498

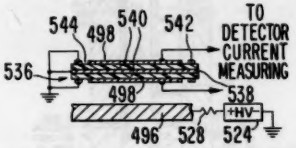
TOMOGRAPHIC SCANNING APPARATUS WITH IONIZATION DETECTOR MEANS

Janos A. Racz, San Jose, and Edward J. Seppi, Menlo Park, both of Calif., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 854,175, Nov. 23, 1977, abandoned, which is a continuation of Ser. No. 722,929, Sep. 13, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,443

Int. Cl.[2] G02B *5/00*; G01T *1/18*

U.S. Cl. 250—385 **2 Claims**



1. In a computerized tomographic system for examining a subject by means of penetrating radiation to enable reconstruction of a representation of the structure residing in a section taken through said subject; said system comprising:

source means for causing penetrating radiation in the form of a substantially planar sheet to enter said subject at a plurality of locations around said section;

detector means for detecting radiation passing through said section; and

signal processing means for receiving the output signals from said detector means;

THE IMPROVEMENT WHEREIN:

said detector means comprises walls forming a sealed chamber containing gas which is ionizable by said radiation, an elongated window in one wall of said chamber for admitting said radiation, said window lying in the plane of said radiation sheet, a plurality of spaced planar electrodes positioned in said chamber such that radiation entering through said window passes between said planar electrodes, said planar electrodes being supported by and between a pair of mutually facing support members, said support members being positioned in spaced relationship with respect to interior wall surfaces of said chamber, and resilient shock absorbing means mounted in at least some of the interspace between said support means and said chamber walls for absorbing vibration and other mechanical shock.

4,217,499

TOMOGRAPHIC SCANNING APPARATUS WITH IONIZATION DETECTOR MEANS

Janos A. Racz, San Jose, and Edward J. Seppi, Menlo Park, both of Calif., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 722,931, Sep. 13, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 936,150

Int. Cl.[2] G01N *21/34*

U.S. Cl. 250—445 T **5 Claims**

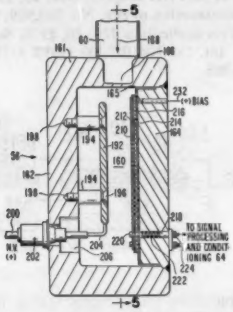
1. In a computerized tomographic system for examining a subject by means of penetrating radiation to enable reconstruction of a representation of the structure residing in a section taken through said subject; said system comprising:

source means for causing penetrating radiation in the form of a substantially planar sheet to enter said subject at a plurality of locations around said section, and detector means for detecting radiation passing through said section; and

signal processing means for receiving the output signals from said detector means;

the improvement wherein:

said detector means comprises a sealed chamber containing gas which is ionizable by said radiation, an elongated window in one wall of said chamber for admitting said radiation, said window lying in the plane of said radiation sheet, said chamber having two side walls extending from said window wall in a direction away from said source, a substantially planar electrode in said chamber adjacent



one of said side walls, a plurality of elongated detector electrodes supported in said chamber on one side of an insulating sheet means which is supported by the other of said side walls, said detector electrodes being spaced apart from each other and facing said planar electrode, said detector electrodes having their long dimension extending toward said window wall, the surface of said planar electrode which faces said detector electrodes lying in a plane substantially parallel to the long axis of said elongated window, and electrical leads separately connecting each of said detector electrodes to said signal processing means.

4,217,500

RADIODIAGNOSIS APPARATUS WITH REMOVABLE INTENSIFYING SCREENS

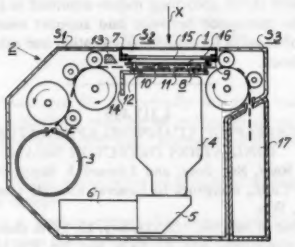
Marcel Bombray, and Jean Caugant, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jan. 30, 1979, Ser. No. 7,896

Claims priority, application France, Feb. 3, 1978, 78 03101

Int. Cl.[2] A61B 6/00; G03B 41/16

U.S. Cl. 250—469 **9 Claims**



1. In a radiodiagnosis apparatus capable of being used either in radioscopy or radiography and equipped with an automatic film changer comprising:

a loading portion for containing a supply roll of unexposed film;

an exposure portion irradiated by a X-ray beam;

and an ejecting and storage portion for the exposed film; the improvement consisting in providing in the exposure portion, upstream, relatively to the X-ray beam, of a luminance amplifying tube, an exposure device including on one hand, a frame fixed to the radiodiagnosis apparatus in its exposure portion rendering said region lighttight, and on the other hand, a removable drawer slidable in the frame and supporting two intensifying screens on each side of the film which arrives directly from the loading portion for radiography, said drawer being removed from the frame for radioscopy by a sliding thereof in the frame in a direction perpendicular to the direction of displacement of the film in the exposure device.

4,217,501

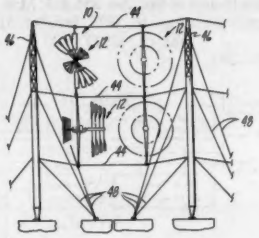
MOUNTING FOR WINDMILLS

William D. Allison, 39 Radnor Cir., Grosse Pointe Farms, Mich. 48236

Filed Oct. 11, 1977, Ser. No. 840,550

Int. Cl.[2] F03D 9/00

U.S. Cl. 290—55 **11 Claims**



1. A windmill structure comprising; a pair of substantially horizontal, flexible cable members suspended between supports, said cable members having first and second points on the cable members, respectively, vertically spaced and aligned relative to each other, a mounting structure, means connecting said mounting structure to both of said flexible cable members at said first and second points for rotation through at least one revolution of said mounting structure relative to said flexible members about a vertical axis passing through said points and said mounting structure, and a windmill supported on said mounting structure to rotate with said mounting structure in accordance with the direction of the wind.

4,217,502

CONVERTER PRODUCING THREE OUTPUT STATES

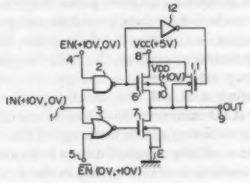
Yasoji Suzuki, Ayase, and Ryuzo Shiraki, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 11, 1978, Ser. No. 941,256

Claims priority, application Japan, Sep. 10, 1977, 52-109138; Sep. 10, 1977, 52-109139; Oct. 26, 1977, 52-128297

Int. Cl.[2] H03K 19/20, 19/08, 17/04

U.S. Cl. 307—205 **10 Claims**



1. A converter for producing three output states, comprising:

a converter circuit comprising a first potential supply termi-

nal for supplying a first potential, an output terminal, a second potential supply terminal having a second potential smaller in absolute value than said first potential, a first IG-FET (insulated gate field effect transistor) means including at least one IG-FET of a first conductivity type series-connected between said first potential supply terminal and said output terminal and having its substrate electrode supplied with a third potential greater in absolute value than said first potential, a second IG-FET means including at least one IG-FET of a second conductivity type series-connected between said output terminal and said second potential supply terminal and having its substrate electrode supplied with said second potential, and control means receptive to an input signal and at least one control signal and adapted to control said first and second IG-FET means so that said output terminal can take one of said first potential, said second potential and a high impedance state; and

a compensation circuit including at least one IG-FET of said second conductivety type series-connected between said first potential supply terminal and said output terminal and having its substrate electrode connected to said output terminal, said compensation circuit being controlled by said control means such that when a potential on said output terminal is shifted from said second potential to said first potential a rise of said first potential is sharpened.

4,217,503

CURRENT LIMITER

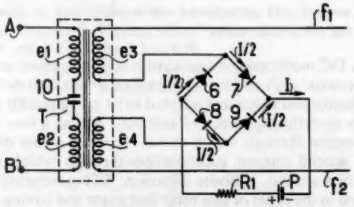
Philippe Hugel, Illkirch Graffenstaden; Henri Kraess, Strasbourg; Remi Louis, Erstein, and Louis Vidonne, Sallanches, all of France, assignors to Societe Anonyme dite: La Telephonie Industrielle et Commerciale-TELIC, Strasbourg, France

Filed Jun. 20, 1978, Ser. No. 917,230

Claims priority, application France, Jun. 30, 1977, 77 20075

Int. Cl.² H03K *5/08*

U.S. Cl. 307—237 **2 Claims**



1. A current limiter for limiting the current flowing in the secondary windings of a transformer having two windings, the current limiter comprising a four diode bridge and a source of DC bias current, the bridge being arranged as a full wave rectifying diode quad with a pair of AC terminals and a pair of DC terminals, the DC terminals being connected to the source of DC bias current and the AC terminals being connected between said two secondary windings of the transformer, the limiting value of the current flowing throught the AC terminals being determined by the DC bias current.

4,217,504

SEMICONDUCTOR SWITCH WITH THYRISTORS

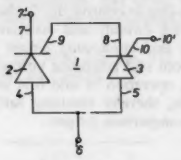
Marius Füllmann, Neu-Isenburg; Friedhelm Sawitzki, Frankfurt am Main, and Dieter Silber, Hausen, all of Fed. Rep. of Germany, assignors to Licentia-Patent Verwaltungs GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 711,689, Aug. 4, 1976, abandoned. This application Mar. 9, 1978, Ser. No. 885,072

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1975, 2534704

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 C **8 Claims**



1. In a semiconductor switch comprising a main thyristor having an anode, a cathode and a control electrode and an auxiliary thyristor having an anode, a cathode and a control electrode, with both of said thyristors being of the type which can be switched on and off by a control current fed to the control electrode of same, and with said anode of said main thyristor being connected to said anode of said auxiliary thyristor and to a first load current terminal for said switch, said cathode of said main thyristor being connected to a second load current terminal for said switch, said control electrode of said main thyristor being connected with said cathode of said auxiliary thyristor, and said control electrode of said auxiliary thyristor being connected to an input terminal for a control current for said semiconductor switch to turn same on and off; the improvement wherein said auxiliary thyristor has a turn-off gain and a holding current which are sufficiently less than the turn-off gain and the holding current respectively of said main thyristor so that said auxiliary thyristor will remain conducting during the current conducting switched-on state of said main thyristor and continuously feed a control current to said control electrode of said main thyristor to reduce the forward voltage drop of said main thyristor, whereby the on-state behavior of said semiconductor switch is improved and the holding current of said semiconductor switch is reduced.

4,217,505

MONOSTABLE MULTIVIBRATOR

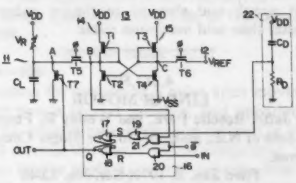
Kazuhide Aoki; Kenji Kawagai, both of Kawasaki; Akira Nagae, Yokohama, and Shuichi Goto, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 26, 1978, Ser. No. 954,822

Claims priority, application Japan, Oct. 28, 1977, 52/129276

Int. Cl.² H03K *3/284*

U.S. Cl. 307—273 **9 Claims**



1. A monostable multivibrator comprising an integrating circuit including a capacitor, a resistor, and an output terminal; a comparator including first and second inverters each con-

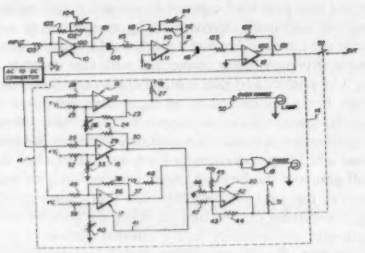
nected between a voltage source and a predetermined potential point, and each having an output terminal; a reference voltage source to produce a reference voltage signal; a first switching transistor circuit connected between the output terminal of said integrating circuit and the output point of said first inverter of said comparator; a second switching transistor circuit connected between said reference voltage source and the output point of said second inverter of said comparator; a flip-flop having at least two input terminals and an output terminal, said input terminals being connected respectively with the output point of said first inverter and a reset signal source, said flip-flop being set to produce an output signal in response to a signal from the output point of said first inverter; and a switching transistor on-off controlled by the output signal of said flip-flop to control the discharge of said capacitor of said integrating circuit; said comparator comparing the output signal of said integrating circuit with said reference voltage signal from said reference voltage source in response to the switching operation of said first and second switching transistor circuits, thereby resetting said flip-flop in accordance with the comparison output.

4,217,506

LEVEL SELECTIVE A-C MONITORING CIRCUIT

Robert E. Sawyer, Jr., Epsom, and Robert J. Donahue, Northwood, both of N.H., assignors to Northern Telecom, Inc., Ottawa, Canada

Filed May 17, 1978, Ser. No. 906,915
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—360 **9 Claims**



1. A circuit for monitoring an a-c input signal comprising a selectable gain amplifier responsive to said input signal, an a-c to d-c converter for converting signals at the output of said selectable gain amplifier to corresponding d-c values, a first comparator for comparing said d-c values to a predetermined minimum d-c value, a second comparator for comparing said d-c values to a predetermined maximum d-c value, said predetermined maximum value corresponding to a maximum acceptable value of said input signal, a third comparator for comparing said d-c values to a predetermined absolute maximum a-c value, and feedback means connected between the output of said first comparator and said third comparator for causing said third comparator to compare said d-c values to said minimum d-c value, said predetermined absolute maximum value corresponding to an absolute maximum acceptable value of said input signal, said absolute maximum acdeptable value being greater than said maximum value.

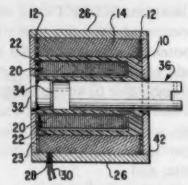
4,217,507

LINEAR MOTOR

Wolfgang Jaffe, Roselle Park, and Wesley R. Peterson, Bound Brook, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jan. 8, 1979, Ser. No. 2,045
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—12 **3 Claims**

1. A linear motor comprising a circular spool formed from a non-metallic, easily molded material, said spool having a central axis with an axial bore formed therethrough, a plurality of cavities formed in said spool parallel to said central axis, said cavities being equally spaced around said axis, said spool also having a plurality of separator ribs separating said cavities one from the other, a plurality of permanent magnets having spaced faces of opposite magnetic polarity, said magnets being received by said cavities in said spool each with a face of like polarity directed toward said axial bore and each with a face of



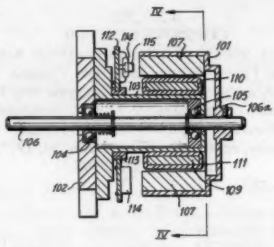
the opposite polarity directed away from said axial bore, a coil of electrically conductive wire wrapped about said spool, means for connecting said coil to a source of electricity, and a cylindrical armature constructed of a ferro-magnetic material slidably received by said axial bore, whereby a magnetic field produced by said permanent magnets reacts with a magnetic field produced when said coil is electrically excited to thereby linearly move said armature within said axial bore.

4,217,508

DC MOTOR

Mitsuo Uzuka, Urawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 7, 1978, Ser. No. 894,487
Claims priority, application Japan, Apr. 8, 1977, 52/40565; Jun. 18, 1977, 52/72689; Feb. 20, 1978, 53/18274
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—46 **40 Claims**



1. A DC motor comprising a rotor to rotate about an axis; a stator coaxial with said rotor; at least two coils included in one of said rotor and stator and adapted to be energized for current to flow therethrough, each of said coils having a first current path portion through which current flows in a first direction and a second current path portion through which current flows in a second, opposite direction; flux generating means included in the other of said rotor and stator and having at least one pair of circumferentially disposed magnetic poles for generating magnetic flux of alternating magnetic field polarity in a rotary path about said axis, said magnetic flux linking each said coil such that, if a coil is energized over an angular region of 360 electrical degrees, a rotational torque of a predetermined direction is produced through a range having an electrical angle greater than 180°; and means for alternately energizing said coils for current to flow through each energized coil for a duration substantially equal to an electrical angle of 180° when said energized coil is within said range of said torque of said predetermined direction.

4,217,509

SINGLE PHASE STEPPING MOTOR

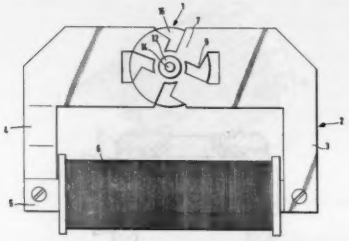
Roland Sudler, Frankfurt, Fed. Rep. of Germany, assignor to Quarz-Zeit AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 17, 1978, Ser. No. 870,134

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1977, 2705685

Int. Cl.[2] H02K 37/00

U.S. Cl. 310—49 R 7 Claims



1. In a single phase stepping motor, particularly for battery driven clocks, with a disc-like, axially magnetized rotor with a number of poles and a stator, the latter being made of two stator parts connected with one another via a bridge part, the latter carrying the excitation winding, of which each stator part has on its free end a smaller number (in comparison to the rotor pole number) of main poles with auxiliary poles attached thereon as well as a passage opening for the rotor shaft, the main poles being staggered relative to one another by the same angle, the main poles being directed towards the face sides of the rotor, the improvement wherein

the main poles and auxiliary poles associated with a stator part form an integral unit made of sheet metal with said stator part,

each of said main poles is formed as an annular-like sector,

said annular-like sector defines a radial limit line, said annular-like sector transfers at said radial limit line into a triangular-like projection, the latter constituting an auxiliary pole, said annular-like sector defines an inner circumferential limit line, said annular-like sector transfers at said inner circumferential limit line into a ring enclosing the passage opening for the rotor shaft.

4,217,510

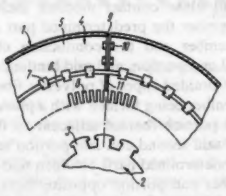
VIBRATION DAMPING STATOR STRUCTURE FOR A HYDROGENERATOR

Felix M. Detinko, prospekt M. Toreza, 104, korpus 3, kv. 23; Alexandr A. Dukshtau, ulitsa Basseinaya, 111, korpus 3, kv. 34, and Grigory B. Pinsky, ulitsa Varshavskaya, 41, korpus 2, kv. 68, all of Leningrad, U.S.S.R.

Filed May 8, 1978, Ser. No. 903,791

Int. Cl.[2] H02K 5/24

U.S. Cl. 310—51 2 Claims



1. A hydrogenerator comprising: a rotor having a plurality of pole pairs; a stator formed as a ring consisting of a plurality of separate arcuately shaped sectors secured to each other, said sectors being formed as individual separate segments; and means for fastening said separated segments one to another to form said ring, the angle subtended by the arc of each arcuately shaped sector being of such a value that the product of said value and the number of pole pairs of said plurality of poles of said rotor is an integral multiple of π, whereby upon fastening said separate segments together tangential electromagnetic forces acting in abutting planes of every sector segment will be cancelled and stator sector vibrations eliminated.

4,217,511

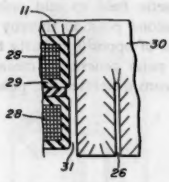
STATOR CORE COOLING FOR DYNAMOELECTRIC MACHINES

Edward I. King, Jr., Monroeville, and Brian J. Reed, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 13, 1978, Ser. No. 915,325

Int. Cl.[2] H02K 9/00

U.S. Cl. 310—55 1 Claim



1. A dynamoelectric machine comprising a laminated stator core made up of packs of laminations having longitudinal slots with walls; insulating winding conductors disposed in said slots, said conductors being substantially in contact with the walls of the slots; axial vent means for flow of coolant gas between said conductors and the slot walls in the packs at the ends of the stator core; said packs of laminations being separated by radial ducts for flow of coolant gas; said axial vent means between the conductors and the slots walls of the packs at the ends of the stator communicating with the adjacent radial ducts and having substantially half of the radial extent of each slot wall substantially in contact with the conductor and the packs at the ends of the stator core and the other half of each slot wall is spaced from the conductor in the packs of laminations at the end of the stator to form said axial vent means.

4,217,512

APPARATUS FOR GENERATING A PULSE WHEN A FIRST MEMBER PASSES A SECOND MEMBER USING PERMANENT MAGNETS WITH DIFFERENT STRENGTHS

Peter Hauler, Karlsruhe; Wolfgang Bremer, Ettlingen; Karl-Ernst Weiss, and Frieder Heintz, both of Stutensee, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,723

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1978, 2817010

Int. Cl.[2] H02K 21/38

U.S. Cl. 310—155 5 Claims

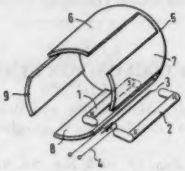
1. In apparatus for generating a pulse upon movement of a first member past a second member, said apparatus having means (3,4) for generating a pulse upon reversal of a magnetic field applied thereto, the improvement comprising

first means (2) for applying a first magnetic field having a first field strength and a first polarity to said pulse generating means;

second means (1) for applying a magnetic field having a second field strength exceeding said first field strength

and a second polarity opposite said first polarity to said pulse generating means;

and magnetic shielding means (5) moving relative to said first and second magnetic field applying means and said pulse generating means for shielding said pulse generating means from said second magnetic field while permitting



application of said first magnetic field when in a first position and for allowing application of said first and said second magnetic field to said pulse generating means when in a second position thereby creating a resultant magnetic field of opposite polarity to said first magnetic field in said pulse generating means so that said pulse generating means generates said pulse.

4,217,513

DIRECT CURRENT MOTOR

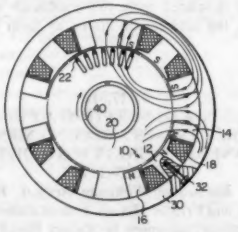
Yoshinori Kohzai, Hino, and Shigeaki Oyama, Hachioji, both of Japan, assignors to Fujitsu Fanuc Limited, Japan

Filed Oct. 28, 1977, Ser. No. 846,428

Claims priority, application Japan, Nov. 10, 1976, 51/150743[U]

Int. Cl.[2] H02K *1/10*

U.S. Cl. 310—186 **11 Claims**



1. A direct current motor provided with an armature and a plurality of field magnet devices disposed around said armature and spaced apart from said armature, wherein each of said field magnet devices comprises:

a main pole having a predetermined polarity; and

a pair of auxiliary poles made of permanent magnets, one of said auxiliary poles being disposed at a position adjacent to one end of said main pole and the other of said auxiliary poles being disposed at a position adjacent to the other end of said main pole, the polarity of each auxiliary pole being the same as that of said main pole and the permeability of each auxiliary pole being smaller than that of said main pole.

4,217,514

STATOR STRUCTURE FOR INDUCTION MOTOR

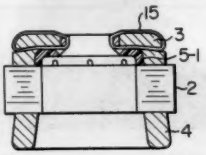
Yuzuru Simazaki, Hitachi; Ryota Doi, Nakamachi; Yuji Kumagai, Tokaimura; Ikou Fukazawa, and Motoo Yamaguchi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 18, 1978, Ser. No. 907,301

Claims priority, application Japan, May 23, 1977, 52/58642

Int. Cl.[2] H02K *3/46*

U.S. Cl. 310—260 **17 Claims**



1. A stator structure for an induction motor, comprising:

a stator iron core having a cavity for rotatably accommodating a rotor;

a winding assembly accommodated in said stator iron core, said winding assembly having first and second coil end portions opposed to each other with respect to said stator iron core, said first coil end portion being shaped to have a bell-shaped flared opening, said second coil end portion forming a short-passed winding and being shaped to have an opening sufficiently large for a shaft of the rotor to pass therethrough in the presence of the rotor in said cavity;

a coil-supporting member firmly held between said second coil end portion and a given portion of the outside surface of said stator iron core, said coil-supporting member having an outer surface shaped along the inside surface of said second coil end portion and an inner surface shaped to provide a sufficient air gap between said inner surface and the rotor, when the rotor is accommodated in said cavity in use, said coil-supporting member being made of an elastic material and elastically force-fit mounted between the inside surface of said second coil end portion and the given portion of the outside surface of said stator iron core in close contact with the inside surface of said second coil end portion; and

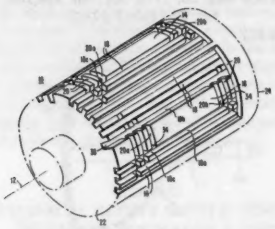
means for bringing at least part of said coil-supporting member into close contact with said second coil end portion and rendering them relatively immovable,

in which said close contact member includes means for binding together the predetermined part of said coil-supporting member and the conducting elements of said second coil end portion, and said binding means include a plurality of braided ropes of polyester fiber, said coil-supporting member being formed with a plurality of first slots at one end portion thereof adjacent to the shaft-passing opening of said second coil end portion and a plurality of holes at predetermined parts between said one end portion and the other end portion opposite thereto, each of said braided ropes extending through selected one of said first slots and selected one of said holes corresponding to said selected one of said first slots, thereby binding the conductor elements of said second coil end portion on a predetermined part of said coil-supporting member.

4,217,515
EMBEDDED FIELD WINDING END TURNS FOR DYNAMOELECTRIC MACHINE ROTORS

Lawrence J. Long, Economy Borough, Pa., and Jacques E. Albaric, Fontainebleau, France, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1978, Ser. No. 877,778
Int. Cl.[2] H02K *3/46*
U.S. Cl. 310—270 **11 Claims**

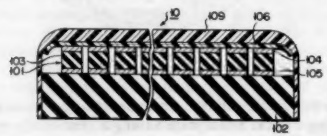


1. A dynamoelectric machine comprising:
a rotor having radially directed longitudinal slots and circumferential slots of predetermined axial length and arc length respectively, each of said longitudinal slots intersecting at least one circumferential slot on each axial end region of the rotor, said intersecting circumferential and longitudinal slots being grouped into sets with each set being disposed about a pole region of said rotor;
a field winding disposed in said slots, said winding having end turn portions which are arranged in said circumferential slots; and
wedge means for retaining said winding within said slots, and wedge means being slidably insertable into selected slots, said wedge means which are insertable in said circumferential slots having arcuate lengths less than or equal to the circumferential width of said longitudinal slots.

4,217,516
PROBE FOR ULTRASONIC DIAGNOSTIC APPARATUS

Kazuhiro Iinuma; Kinya Takamizawa, and Ichiro Ogura, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 25, 1977, Ser. No. 790,743
Claims priority, application Japan, Apr. 27, 1976, 51-48037
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—335 **19 Claims**

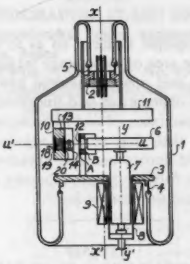


1. A probe for electronic scanning-type ultrasonic apparatus comprising:
(a) supporting means;
(b) a plurality of electro-acoustic transducers to be energized substantially at the same time, the transducers having bottom surfaces fixedly positioned and supported in spaced relationship in a linear array on the supporting means to form fixed acoustically decoupling gaps between adjacent transducers and having corresponding top surfaces arranged substantially parallel to the bottom surfaces;
(c) a flexible film fixedly laid over the top surfaces of the transducers and closing the tops of the decoupling gaps without filling the gaps to minimize acoustic coupling and vibratory interference between adjacent transducers; and
(d) a protective film laid over said flexible film and formed of material in which ultrasonic waves travel at a higher speed than in water, said protective film being constant in thickness along the sides of said transducers, thin in the top central area and thick in both top end portions to form a concave shape.

4,217,517
SMALL DIVERGENCE X-RAY TUBE

Jacques Delair, and Jacques Le Guen, both of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Jan. 18, 1979, Ser. No. 4,558
Claims priority, application France, Jan. 24, 1978, 78 01878
Int. Cl.[2] H01J *35/06, 35/10, 35/14*
U.S. Cl. 313—56 **10 Claims**



1. An x-ray tube comprising an evacuated glass casing having therein:
a cathode which emits an electron beam;
an anode whose surface is bombarded by the said electron beam and emits an x-ray beam;
a curved divergence reduction diaphragm having a fan-shaped opening equipped with parallel, x-ray opaque blades, located close to the anode in front of the x-ray emitting surface so that the opaque blades cut said x-ray beam into fan-shaped x-ray beams with a small divergence, and at a distance from the tube, before an object normally receives the x-rays, the beams regroup to join in a single flat, fan-shaped x-ray of small divergence, said distance being a function of the length of the blades in the direction of the propagation of the x-rays, their spacing, and the divergence of the beams.

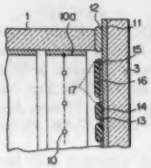
4,217,518
DIRECT-VIEWING STORAGE TUBE WITH OPAQUE STRIP ON TRANSPARENT COLLECTOR ADJACENT SCAN AREA

Norio Harao; Hiroki Tokizawa, and Teruhide Nishikawa, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 820,913, Aug. 1, 1977, abandoned, which is a continuation of Ser. No. 649,272, Jan. 15, 1976. This application Jan. 3, 1979, Ser. No. 795
Claims priority, application Japan, Jan. 17, 1975, 50-7619
Int. Cl.[2] H01J *29/10, 31/08*
U.S. Cl. 313—398 **1 Claim**

1. A direct-viewing storage tube having an envelope containing a writing gun and at least one reading gun and a storage target provided on the inner wall of a faceplate sealing the opening of a funnel constituting the envelope, wherein the storage target comprises a transparent collector electrode formed on the inner wall of the faceplate; a mesh-like electrode made of opaque material, bored with a plurality of apertures and mounted on the collector electrode; a plurality of fluorescent dot islands embedded in said apertures in contact with the

transparent collector electrode; an opaque layer provided on the transparent collector electrode lying between those of the fluorescent dot islands which are arranged on the outermost peripheral edge of the storage target and a sealed portion joining the opening of the funnel and faceplate so as to continuously surround the effective areas of the storage target; and a fluorescent layer formed of the same kind of fluorescent compound as that which constitutes the fluorescent dot islands and



mounted on the opaque material so as to continuously surround the effective area of the storage target, said fluorescent layer mounted on said opaque material having a width of at least ten times the diameter of said fluorescent dot island;

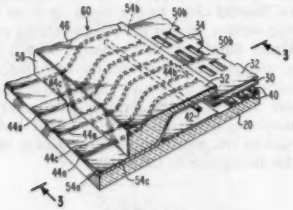
whereby the capacitance of said fluorescnet layer is substantially greater than that of said adjacent peripheral dot islands and said fluorescent layer thereby neutralizes local surface charge formed thereon, thereby suppressing luminescence of said fluorescent layer.

4,217,519

ISOLATION BUSBAR FOR A FLAT PANEL DISPLAY DEVICE

Carmen A. Catanese, Rocky Hill, and Louis S. Cosentino, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 17, 1979, Ser. No. 4,178
Int. Cl.[2] H01J *29/52, 29/88, 29/90*
U.S. Cl. 313—411 **6 Claims**



1. In a display device having an evacuated envelope with substantially parallel front and back walls, an electron beam guide comprising a pair of guide plates, each of said guide plates having a plurality of apertures therethrough, a modulator structure including in combination a modulator member and said back wall, said modulator structure having a plurality of control electrodes forming opposing pairs of electrodes thereon, said electrodes partially overlapping said beam guide without overlapping said apertures, an electron generating means for generating beams of electrons extending between said opposing pairs of electrodes across one end of said beam guide, and a cathodoluminescent screen on the front wall, the improvement comprising,

interconnecting means for biasing selected ones of said control electrodes which operate at a common potential, thereby decreasing the number of control electrodes which extend from said evacuated envelope, and

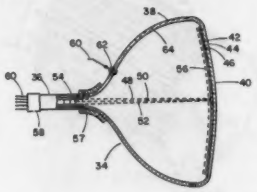
shielding means for attenuating the electric field emanating from said interconnecting means thereby preventing perturbation of the electron beams generated by the electron generating means.

4,217,520

IMAGE DISPLAY FACEPLATE HAVING A CHROMATIC MATRIX

Meyer L. Sugarman, Northbrook, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 30, 1978, Ser. No. 938,208
Int. Cl.[3] H01J *29/32*
U.S. Cl. 313—472 **5 Claims**



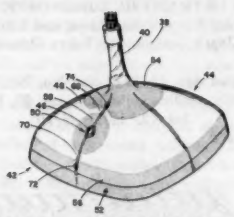
1. An image display having a viewing faceplate for exhibiting an informational color image, said faceplate having a light-absorbing matrix surrounding mutually spaced elemental areas, said faceplate and said areas including a plurality of different colorants, said faceplate showing a body color of an undesired hue, with said image display being characterized by said matrix having a color complementary to said hue effective to counteract said hue and provide a substantially neutral body color.

4,217,521

HIGH POTENTIAL STATIC DISCHARGE MEANS FOR TELEVISION CATHODE RAY TUBES

Leonard Dietch, Skokie, and James W. Schwartz, Deerfield, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 21, 1977, Ser. No. 862,893
Int. Cl.[2] H01J *29/00, 31/00*
U.S. Cl. 313—479 **1 Claim**



1. In a television cathode ray tube having a glass envelope comprising a neck, a faceplate having a rearwardly extending supporting flange, and a funnel including an anode button therethrough for receiving a high potential, and having a conductive coating nominally at ground potential normally deposited on the outside surface of said funnel to serve as a component of a power supply filter capacitor and configured so as to provide an electrically isolative gap around said anode button, said surface also having a pattern of normally uncoated areas including said gap around said anode button, said tube being subject to an undesired build-up of localized high-potential static charges on one or more of said normally uncoated areas adjacent to said conductive coating resulting in an annoying crackling sound due to a rush of electrons upon tube turn-on and turn-off, with said tube also being subject to an undesired high-potential charge retention after turn-off, said tube being characterized by having a resistive coating deposited on

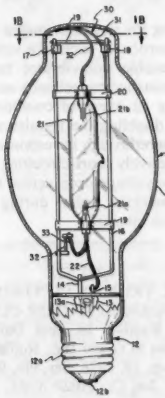
at least one of said normally uncoated areas including said gap around said anode button between said anode button and said grounded conductive coating and in electrical contact with said anode button and said resistive coating, and a resistive coating deposited in a band around said envelope in the region of said neck and in electrical contact with said conductive coating, said mutually isolated resistive coatings around said anode button and on said neck being separated one from the other by a conductive strip forming part of said conductive coating effective to isolate said coating in the region of said neck from the high potential of said anode button, said resistive coating in the region of said neck being a field at ground potential, the contact of said resistive coating in the region of said neck with said conductive coating causing a dispersion of any such static charges by means of a flow of electrons through said resistive coating whereby said rush of electrons is attenuated to suppress said crackling sound and any residual high-potential charges are discharged to ground.

4,217,522

MECHANICAL SAFETY SWITCH FOR HIGH INTENSITY DISCHARGE LAMPS

Herbert S. Strauss, Paramus, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.

Filed Feb. 16, 1978, Ser. No. 878,322
Int. Cl.[2] H01J *7/44, 13/46, 19/78;* H01K *1/62*
U.S. Cl. 315—73 **12 Claims**



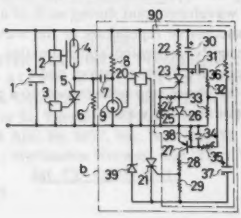
1. A high intensity discharge lamp comprising:
an outer envelope having lead-ins for supplying electric current passing therethrough, said outer envelope being capable of transmitting light in the visible range and blocking radiation within a predetermined range,
an arc discharge tube mounted within said outer envelope, said arc discharge tube including a pair of electrodes sealed therein and a quantity of ionizable material which upon excitation produces light in the visible range and in said predetermined range which passes through said arc tube to said outer envelope,
and means for electrically connecting the electrodes of the arc discharge tube to the lead-ins of the outer envelope for supplying electrical current to said arc discharge tube electrodes, said connecting means including a first leaf spring electrically connected to one of said electrodes and a second leaf spring, each of said first and second leaf springs being resilient along its respective length, each of said first and second leaf springs having thereon an electrical contact surface area which is formed by the width of each said leaf spring and a part of the length of each said leaf spring extending in a first direction along the length of the leaf spring which is generally transverse to the width of the respective leaf spring, the length of the respective contact surface area of each of said first and second leaf springs in said first direction being at least as long as the width of the respective leaf springs, means electrically connecting said second leaf spring to one of said lead-ins of said outer envelope, said first and second leaf springs being positioned such that the outer envelope provides a restraining force to deform the leaf springs from a relaxed condition and to hold the electrical contact surface areas of the two leaf springs in a generally aligned and electrically contacting relationship such that physical and electrical contact over their respective electrical contact surface areas is achieved to thereby provide current from said one lead-in to said one electrode, breaking of the envelope causing the restraining force to be removed with the two leaf springs moving apart to remove the current supply to said one electrode.

4,217,523

PHOTOGRAPHIC FLASH DEVICE

Shinji Hirata, Higashiosaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Nov. 9, 1977, Ser. No. 850,031
Claims priority, application Japan, Nov. 18, 1976, 51/139220
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **6 Claims**

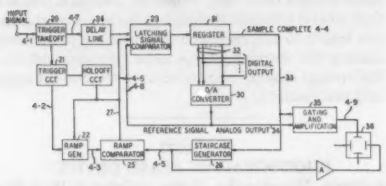


1. In a photographic flash device comprising
a gas discharge flash tube,
a main capacitor which stores electric charge to be fed to said gas discharge flash tube, and
a stopping circuit which stops discharging of said gas discharge flash tube after a selected time period from a start of the flashing,
the improvement wherein said stopping circuit includes a circuit which adjusts said time period in response to a voltage of said main capacitor and comprises
discharge stopping means,
triggering circuit means which sends a triggering signal to said discharge stopping means to stop a discharging of said gas discharge flash tube,
first switching means which sends a signal to said triggering circuit means to cause it to produce a triggering signal,
controlling circuit means which adjusts the time when said switching means sends said signal,
said controlling circuit means including
a first capacitor which is charged to a voltage dependent on the voltage of said main capacitor,
second switching means which turns on based on a discharging in said flash tube and discharges the charge of said first capacitor,
a second capacitor which is charged by a voltage produced by the discharging of said first capacitor,
an RC time constant circuit comprising said second capacitor and a variable resistor through which said charging of said second capacitor is made and with which a setting of a selection of said time period is made, and
a triggering circuit which triggers said first switching means when said second capacitor is charged up to a specified voltage.

4,217,524
METHOD AND STRUCTURE FOR GENERATING REPRESENTATIONS OF REPETITIVE ELECTRICAL WAVEFORMS

George W. Kinder, Columbus, and Harry Winter, Granville, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1978, Ser. No. 904,769
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—364 19 Claims



1. A method of generating a representation of a repetitive electrical waveform by sampling the magnitude of a plurality of points on the waveform, said method being characterized by the steps of

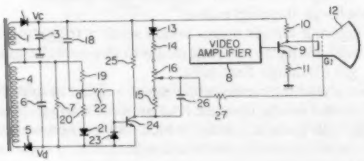
generating an approximation of the magnitude of a prescribed waveform point during each of a prescribed number of successive repetitions of the waveform using the most recently generated approximation to generate the next successive approximation, and

repeating the above step with respect to a plurality of other points spanning the waveform.

4,217,525
SPOT KILLER CIRCUIT

Kansei Nakamura, Fujisawa; Hikoichi Kusumoto, Chigasaki, and Yoshinobu Yokono, Kamakura, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 25, 1979, Ser. No. 33,261
Claims priority, application Japan, May 12, 1978, 53-56919
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—381 5 Claims

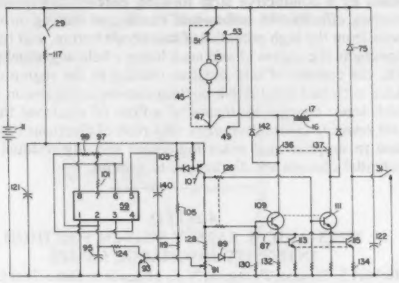


1. A spot killer circuit wherein a transistor is interconnected in series between the first grid of a picture tube and a low voltage supply for supplying a voltage to said first grid; the input point of said transistor is connected to a high voltage supply through a time-constant circuit which may cut off said transistor for a time interval required for discharging the charge on the anode of said picture tube when a power switch is opened, the high voltage supply supplying a higher voltage than said low voltage supply; and the output point of said transistor is connected to said high voltage supply, whereby when the power switch is opened, said transistor is cut off and consequently the potential of the first grid of said picture tube rises.

4,217,526
D.C. MOTOR SPEED CONTROLLER

James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed May 22, 1978, Ser. No. 908,288
Int. Cl.[2] H02P *5/06*
U.S. Cl. 318—139 14 Claims



1. Circuitry for manually controlling the energy supplied from a D.C. source to a motor comprising:

transistor means operable when enabled to couple the source to the motor;

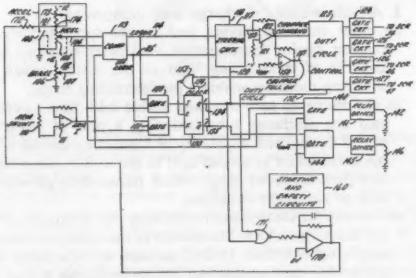
means for enabling the transistor means during a selectively determinable portion of each of a series of time intervals including an astable mulivibrator having a duty cycle determining resistance-capacitance network; and

means for sensing an overload condition of the transistor means and for disabling the transistor means to preclude current flow therethrough in response thereto, the means for sensing effectively short-circuiting the network capacitance when the voltage drop across the transistor means exceeds a preselected value during said determinable portion of a time interval.

4,217,527
ELECTRICAL VEHICLE CONTROLLER WITH PROGRAMMED MOTOR CURRENT

Robert F. Bourke, Kamiah, Id., and David M. Thimmesch, Elgin, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 19, 1978, Ser. No. 943,873
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—139 8 Claims



1. In combination with a battery power source, a propulsion motor, a power converter having controlled switches for controlling power delivered from the battery to the motor and alternate conducting means for maintaining current flow in the motor, the improvement comprising, control means for producing a demand signal relating to demanded motor current, sensing means for producing a signal relating to actual motor current, duty cycle control means for controlling the duty

cycle of the converter to cause the actual current to match the demanded current, means for producing a duty cycle signal having a value dependent on the operating duty cycle of the converter, and means responsive to said last mentioned means for increasing the demand signal at minimum duty cycle and progressively decreasing said demand signal with increasing duty cycle so as to increase torque at low speed while maintaining the current through the controlled switches within ratings.

4,217,528

APPARATUS FOR PREVENTING MALFUNCTION IN A CIRCUIT CONTROLLING AN ELECTRICAL COMPONENT MAINTAINING A RESIDUAL VOLTAGE AFTER REMOVAL OF ENERGIZATION

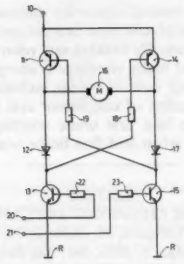
Hans Scheying, Leonberg, and Richard Schleupen, Ingersheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,284

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709627

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—293 **9 Claims**



1. A control system for connection to a voltage source (**10, R**) having a first, second, third and fourth controlled switching element (**11, 13, 14, 15**) connected to form, respectively, the first, second, third and fourth arm of a bridge circuit, at least one of said switching elements (**14**) having a control electrode connected to an arm of the bridge circuit other than the arm of which the respective switching element is a part;

an electrical component (**16**) connected in the detecting branch of said bridge circuit, said electrical component furnishing a residual voltage of polarity opposite to the voltage source after termination of current flow therethrough; and

at least one rectifier element (**12**) connected between one terminal of said electrical component and said control electrode of said at least one controlled switching element,

wherein, in accordance with the invention,

the rectifier element (**12**) is poled in a direction to block said residual reverse polarity voltage from said control electrode.

4,217,529

PROPULSION SYSTEM FOR ELECTRICAL VEHICLE

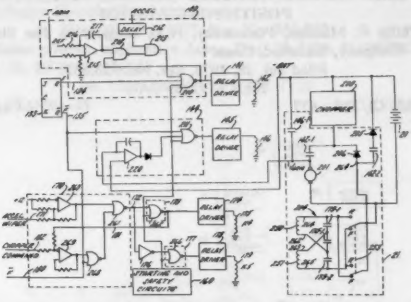
Robert F. Bourke, Kamiah, Id., and David M. Thimmesch, Elgin, Ill., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Sep. 19, 1978, Ser. No. 943,876

Int. Cl.[2] H02P *5/06*

U.S. Cl. 318—351 **10 Claims**

1. In an electric vehicle having a battery power source, a separately excited DC propulsion motor, a power converter for controlling application of power from the battery to the motor, and control means for establishing the operating level of the converter, the improvement comprising at least two sets of shunt field windings in the motor, switch means having a series mode for connecting the winding sets in series with each other and a parallel mode for connecting the winding sets in parallel with each other, the control means including means for detecting a condition of torque demand exceeding a predetermined level, and means responsive to the detecting means and operative on the switch means for temporarily switching to the parallel mode to increase field flux and thereby satisfy said torque demand.



4,217,530

SYSTEM OR THE ACCURATE POSITIONING OF AN APPARATUS ALONG A PATH OF MOVEMENT BY MEANS OF A DIGITAL POSITION READER UNIT

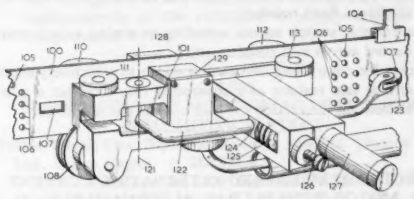
Jan Dahm, Vagslia 24, Tertnes, Norway

Filed Apr. 26, 1977, Ser. No. 790,972

Claims priority, application Norway, Apr. 27, 1977, 761437

Int. Cl.[2] G05B *5/01*

U.S. Cl. 318—623 **4 Claims**



1. In a system for accurately positioning an article transfer assembly in a preselected one of several possible positions in at least one of a vertical and horizontal path of movement by remotely controlling said assembly via a digital position reader unit, the improvement which comprises

(a) belt control means extending parallel to said paths of movement of said assembly and provided with a series of mutually separate and locally disposed position-defining control elements, a corresponding series of mutually separate and locally disposed position-indicating control elements and a corresponding series of mutually separate and locally disposed locking elements; and

(b) carrier means combined with said assembly via an elastically yielding connection and displaceably engaging said control means by means of guide means, said carrier means being provided with search means adapted to cooperate with said position-defining control elements and with said position-indicating control elements and locking means adapted to cooperate with said locking elements; stopping and starting of said assembly being controlled by remote control via said digital position reader unit on cooperatingly controlling said control elements and said

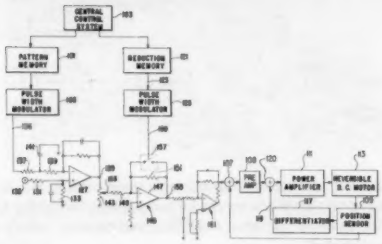
search means relative to each other and said locking means relative to said locking elements.

4,217,531

DIGITALLY CONTROLLED GAIN REDUCTION IN A POSITIONING SYSTEM

Philip F. Minalga, Piscataway, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jul. 28, 1978, Ser. No. 928,937
Int. Cl.[2] G05F *1/00*
U.S. Cl. 318—677 **6 Claims**



1. In a system for positioning an instrumentality over a predetermined range in response to a digitally coded position signal including digital to analog converter means for generating a positional analog signal related to said digitally coded position signal and closed loop servo means including a reversible electric motor responsive to said positional analog signal for positioning said instrumentality, the improvement comprising means for selectively reducing the movement of said instrumentality including:

an operational amplifier interposed between said digital to analog converter means and said closed loop servo means, said operational amplifier having a feedback circuit including a fixed resistor;

controllable switch means including an analog switch connected across said resistor; and

means for controlling said switch means to selectively short circuit said resistor at a controlled rate to effect a controlled gain reduction for said operational amplifier.

4,217,532

ELECTRICALLY BRAKED ALTERNATING CURRENT MOTOR WITH PLURAL, ALTERNATIVELY ENERGIZABLE BRAKE WINDINGS

Robert L. Alfieri, 6123 Cambridge Ave., Cincinnati, Ohio 45230; James D. Grice, 4452 Greenwich Village Ave., Dayton, Ohio 45406, and William D. Greene, 5430 David Dr., Tipp City, Ohio 45371

Filed Feb. 15, 1978, Ser. No. 877,954
Int. Cl.[2] H02P *1/40*
U.S. Cl. 318—759 **8 Claims**

1. An electrically braked alternating current motor comprising:

a stator;

a selectively energizable run winding wound on said stator and arranged to form a given number of poles;

a first selectively energizable brake winding wound on said stator and arranged to form a greater number of poles than said given number;

at least a second selectively energizable brake winding wound on said stator and arranged to form a greater number of poles than said given number;

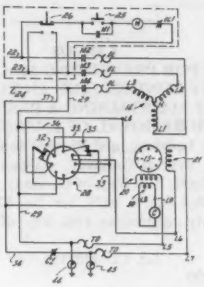
each of said brake windings, when energized, being capable of braking said motor;

a sensor coil responsive to current induced therein by said first brake winding and wound on said stator with said first brake winding such that said sensor coil fails when said first brake winding fails;

a rotor rotatably mounted with respect to said stator;

a winding on said rotor;

a first circuit control means for selectively energizing said run winding, said stator driving said rotor for rotation when said run winding alone is energized; and



a second circuit control means for alternatively selectively energizing one of said first and second brake windings, said stator electrically braking said rotor when one of said first and second brake windings is energized;

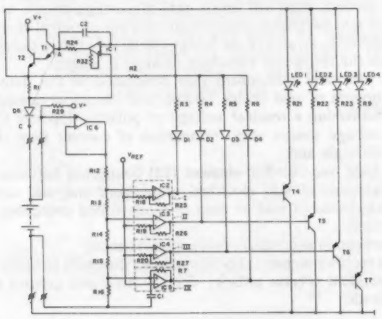
said second circuit control means including a changeover relay under control of said sensor coil for automatically switching from said first brake winding to said second brake winding when said first brake winding fails.

4,217,533

DEVICE FOR CHARGING ACCUMULATORS

Dirk A. Van Beek, Villapark 20, Geldrop, Netherlands

Filed Mar. 8, 1978, Ser. No. 884,590
Claims priority, application Netherlands, Mar. 8, 1977, 7702457
Int. Cl.[2] H02J *7/04*
U.S. Cl. 320—23 **8 Claims**



1. A device for charging accumulators comprising;

input means for removable conductive connection to an accumulator to be charged for sensing the terminal voltage thereof;

initial charging means conductively connected to said input means to supply a substantially constant dc-charging current to the accumulator in response to the initially sensed terminal voltage during a first charging interval until a predetermined voltage level is attained as the sensed terminal voltage such predetermined voltage level being substantially lower than a voltage level for said accumulator when fully charged;

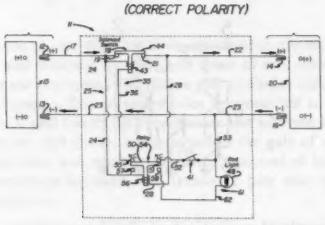
sequential charging means conductively connected to said

input means for further charging said accumulator in a predetermined number of subsequent different time intervals subsequent to said first charging interval with differently decreasing dc-charging currents in each time interval, respectively, and said sequential charging means including means for mutually independently setting both each time interval and the decreasing rate of each decreasing dc-charging current to permit a minimum gasification of water from the accumulator and a minimum duration charging time.

4,217,534
VEHICLE BATTERY POLARITY INDICATOR

Loren Cole, 144 Ione St., Ione, Calif. 95640

Filed Nov. 20, 1978, Ser. No. 962,202
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—25 3 Claims



1. Vehicle battery polarity indicator comprising:

a. a first jumper cable connectable at one end to one electrode of a charged battery and at the other end to one electrode of a discharged battery;

b. a second jumper cable connectable at one end to the other electrode of a charged battery and at the other end to the other electrode of a discharged battery;

c. a solenoid switch interposed in said first jumper cable between said ends thereof, said solenoid switch including a pair of normally open solenoid contacts, a solenoid coil, and solenoid armature means for closing said solenoid contacts upon energization of said solenoid coil;

d. a polarity sensing circuit including a first conductor connected at one end to the portion of said first jumper cable between said solenoid switch and the charged battery and at the other end to the portion of said first jumper cable between said solenoid switch and the discharged battery, said first conductor including a relay coil, said relay coil being energized in excess of a threshold amount only when said one electrode of the charged battery is of reversed polarity with respect to said one electrode of the discharged battery;

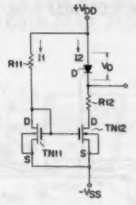
e. a relay magnetically actuated by said relay coil only when said relay coil is energized in excess of said threshold amount, said relay including at least one switch; and,

f. an off-on safety circuit including a second conductor having one end connected to the portion of said first jumper cable between said solenoid switch and the charged battery and the other end connected to said second jumper cable, said off-on safety circuit including a manually operated off-on switch interposed in said second conductor, said second conductor being connected to said solenoid coil and to one of said relay switches and to said off-on switch in series so that both said one of said relay switches and said off-on switch must be closed to energize said solenoid coil and thus close said normally open solenoid switch in order to effect charging of the discharged battery.

4,217,535
CONSTANT-VOLTAGE CIRCUIT WITH A DIODE AND MOS TRANSISTORS OPERATING IN THE SATURATION REGION

Yasoji Suzuki, Ayase; Takeshi Hitotsuyanagi, Kawasaki, and Tetsuya Iida, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 23, 1977, Ser. No. 864,085
Claims priority, application Japan, Dec. 25, 1976, 51/156942; Dec. 25, 1976, 51/156943
Int. Cl.[2] H02J 7/10; H03K 3/26
U.S. Cl. 320—48 15 Claims



1. A constant-voltage circuit comprising:

first and second power supply terminals between which a battery power source is connected;

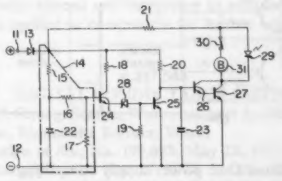
a series circuit of a diode and a one-channel type first insulated-gate field-effect transistor with the source-drain path thereof connected in series with said diode between said first and second power supply terminals, said diode of said series circuit being connected in the forward direction with respect to the polarity of a voltage applied between said first and second power supply terminals; and

a bias circuit connected between said first and second power supply terminals and to said first transistor to allow said first transistor to operate in the saturation region, whereby the voltage across said diode is kept substantially constant independently of the variations in supply voltage and temperature.

4,217,536
SUPPLY VOLTAGE MONITORING DEVICE FOR AUTOMOTIVE BATTERY

Toshio Izumi, Ota, Japan, assignor to Sawafuji Electric Co., Ltd., Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 899,225
Claims priority, application Japan, Sep. 14, 1977, 52/123820[U]; Nov. 22, 1977, 52/156987[U]
Int. Cl.[2] G08B 21/00; H02J 7/00
U.S. Cl. 320—48 6 Claims



1. A supply voltage monitoring device for automotive battery for monitoring the supply voltage of an automotive battery used as a power source for various on-board equipment, having an average voltage generation circuit for producing the average voltage of the battery supply voltage, a Zener diode which conducts only when the output voltage of the average voltage generation circuit exceeds the prescribed value, a first transistor connected between the Zener diode and the average

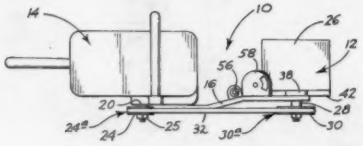
voltage generation circuit, a second transistor controlled by the conducting Zener diode, a capacitor controlled by the output of the second transistor, third transistors controlled by the output voltage of the capacitor, and a light emitting diode whose light emitting state is controlled by at least the third transistors, and characterized in that the device is constructed so as to monitor the battery supply voltage by the light emitting state of the light emitting diode.

4,217,537

CHAIN SAW DRIVEN GENERATOR

David E. Hamm, 1616 SW. Sunset Blvd., Portland, Oreg. 97201

Filed Apr. 7, 1978, Ser. No. 894,560
Int. Cl.[2] H02J *9/14, 7/32*
U.S. Cl. 320—56 **2 Claims**



1. In a vehicle having an engine, a battery, an engine-mounted generator which includes a rotor shaft pulley, and a fan belt operatively connecting the vehicle engine to said pulley, to rotate the same, and thus to charge said battery, apparatus for adapting a chain saw engine unit having a power-driven shaft to effect charging of said battery when said fan belt has been disengaged from said pulley, said apparatus comprising

a driving pulley attachable to said power-driven shaft for rotation therewith,

belt means trainable over said driving and rotor shaft pulleys, and

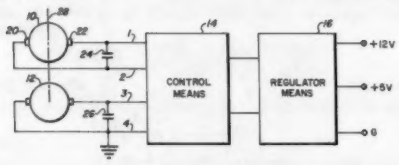
a brace attachable to said engine unit to form therewith a lever arm which is mountable on said vehicle engine for pivoting thereabout, thus to produce variable spacing between the driving and rotor shaft pulleys.

4,217,538

REGULATED PERMANENT MAGNET D.C. POWER SUPPLY

Michael S. Ziemacki, Winter Haven, Fla., assignor to Wolff Controls Corporation, Winter Haven, Fla.

Filed Sep. 22, 1978, Ser. No. 944,720
Int. Cl.[2] H02P *9/10*
U.S. Cl. 322—29 **34 Claims**



1. A regulated D.C. power supply comprising

a. a variable RPM drive means;

b. means for generating a magnetic field;

c. first winding means coupled to said drive means and positioned within the magnetic field for generating a first output voltage proportional to the RPM of said drive means;

d. second winding means coupled to said drive means and positioned within the magnetic field for generating a second output voltage proportional to the RPM of said drive means, the first output voltage being greater than the second output voltage;

e. control means coupled to said first and second winding means for selectively connecting said first and said second winding means to produce an output voltage as close as possible to a predetermined value as the RPM of said drive means changes; and

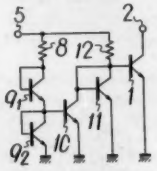
f. regulator means coupled to said control means for regulating the output voltage from said control means to a level as close as possible to a desired output voltage.

4,217,539

STABILIZED CURRENT OUTPUT CIRCUIT

Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 28, 1978, Ser. No. 964,345
Claims priority, application Japan, Dec. 14, 1977, 52-150312
Int. Cl.[2] G05F *3/08*
U.S. Cl. 323—4 **4 Claims**



1. A stabilized current output circuit comprising:

(a) a DC power source having a pair of terminals;

(b) a series circuit consisting of a first resistor and m number of diodes, said series circuit being connected at one end thereof to one terminal of said DC power source and at the other end thereof to the other terminal of said DC power source;

(c) a first transistor which forms a first current mirror circuit together with the last diode of said series circuit located closest to said other terminal of said DC power source, said last diode being connected between the base and emitter of said first transistor;

(d) a second resistor connected between a collector of said first transistor and said one terminal of said DC power source;

(e) a diode connected between the collector of said first transistor and said other terminal of said DC power source; and

(f) an output transistor whose base is connected to the collector of said first transistor, said output transistor and last-mentioned diode forming a second current mirror circuit, wherein resistance values of said first and second resistors are selected in connection with said number m to produce a stabilized constant current at the collector of said output transistor.

4,217,540

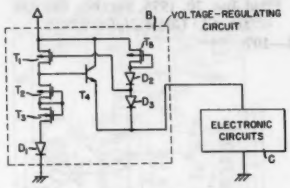
VOLTAGE REGULATED ELECTRONIC TIMEPIECE

Nobuo Shimotsuma, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,594
Claims priority, application Japan, Jun. 27, 1977, 52-76807
Int. Cl.[2] G05F *3/08*
U.S. Cl. 323—22 R **4 Claims**

1. In an electronic timepiece having an electronic circuit, a voltage regulating circuit for supplying a regulated voltage to said electronic circuit, said voltage regulating circuit comprising: an N-MOS and a P-MOS transistor pair each having a respective gate, source and drain and connected in series with their respective drains and gates connected together at a common junction; and constant current source means for providing

a constant current through said transistor pair for developing the regulated voltage thereacross in response to the constant current flowing therethrough; wherein said constant current source means is comprised of a third MOS transistor connected in series with said transistor pair, and biasing means for biasing said third MOS transistor to provide a constant current through said transistor pair; and wherein said biasing means is comprised of a fourth MOS transistor having a gate, a source and a drain, wherein the source of said fourth MOS transistor



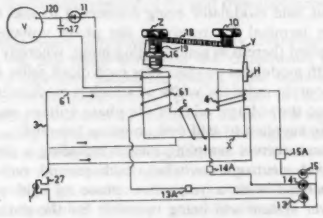
is connected to said third MOS transistor opposite said transistor pair, and wherein the gate and drain of said fourth MOS transistor are connected together, a pair of diodes connected in series, wherein a first of said diodes is connected to the gate and drain of said fourth MOS transistor and wherein a connection between said diodes is connected to the gate of said third MOS transistor, and means connecting a second of said diodes to a connection between said transistor pair and said third MOS transistor.

4,217,541

METHOD OF ACCURATE CONTROL OF CURRENT AND POWER OF A MAGNETIC CURRENT AND POWER CONTROL DEVICE

Morton Weintraub; Elliot Waxman, and Bernard Gendelman, all of Brooklyn, N.Y., assignors to Herman Rossman, Brooklyn, N.Y.

Filed May 18, 1977, Ser. No. 798,261
Int. Cl.[2] G05F 7/00
U.S. Cl. 323—51 **11 Claims**



1. An apparatus for providing accurate control of an electrical condition for at least one output device comprising,

(a) a reactor means having a magnetic core with an air gap located at a top portion of said means,

(b) first wiring means for connection to at least one electrical output device,

(c) a moveable bar for precisely adjusting the opening and closing of said air gap of said reactor means,

(d) said maveable bar supporting a power control knob and a fine tuning knob in conjunction thereon, wherein said fine tuning knob is utilized for fine or decimal tuning operations while said power control knob is utilized for cores, i.e. unit tuning, whereby is provided manual control for an immediate or gradual increase or decrease of the reluctance path available through said reactor means, whereby is provided said accurate control,

(e) a meshing gear connected between said power control knob and said fine tuning knob,

(f) said moveable bar being hingedly affixed to said reactor means,

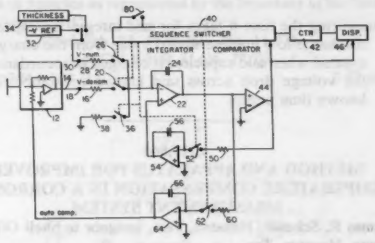
(g) input terminals for connection to a power supply with second wiring means connecting said input terminals to said reactor means.

4,217,542

SELF INVERTING GAUGING SYSTEM

Robert C. Abbe, Newton, and Noel S. Poduje, Needham Heights, both of Mass., assignors to ADE Corporation, Watertown, Mass.

Filed Feb. 13, 1978, Ser. No. 877,332
Int. Cl.[2] G01R 27/02, 27/26, 1/02
U.S. Cl. 324—57 R **17 Claims**



1. A gauging system providing a linearized output representation of a magnitude comprising:

transducer means for sensing a parameter and providing a transducer signal varying in magnitude inversely with respect to the magnitude of said parameter;

means for providing a further signal;

means for incrementing a value at a rate representative of said further signal for a predetermined time interval;

means for decrementing the incremented value at a rate representative of said transducer signal until a predetermined level is achieved; and

means for providing an indication of the interval of time during which said value is decremented to said predetermined level;

said interval of time being directly proportional to the parameter sensed by said transducer;

said means for incrementing and said means for decrementing including an integrator;

means for closing a loop around said integrator to establish a signal applied to compensate for errors in said integrator; and

means for closing a loop around said integrator and said transducer in combination subsequent to the closing of said loop around said integrator to establish a reference signal applied to compensate for further errors.

4,217,543

DIGITAL CONDUCTANCE METER

Norman H. Strong, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

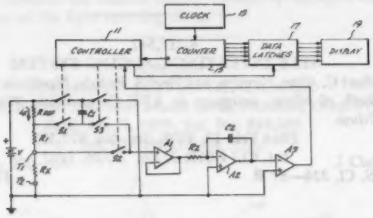
Continuation of Ser. No. 799,693, May 23, 1977, abandoned.
This application Sep. 27, 1978, Ser. No. 946,069
Int. Cl.[2] G01R 27/02; H03K 13/02
U.S. Cl. 324—62 **11 Claims**

1. A method of determining the resistance value of an unknown resistance by measuring the conductance of said unknown resistance comprising the steps of:

passing the same current through both a resistance of known value and said unknown resistance so as create a voltage drop across both said resistance of known value and said unknown resistance;

charging an integrating capacitor in accordance with the voltage drop across said resistance of known value for a known time period;

discharging said integrating capacitor in accordance with the voltage drop across said unknown resistance; and,



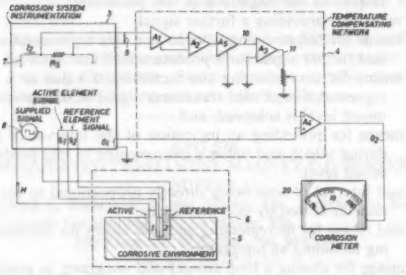
measuring the time it takes for said integrating capacitor to discharge to a predetermined value from the charge level created when said capacitor is charged in accordance with the voltage drop across said known resistance for said known time period.

4,217,544

METHOD AND APPARATUS FOR IMPROVED TEMPERATURE COMPENSATION IN A CORROSION MEASUREMENT SYSTEM

Thomas R. Schmidt, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 16, 1978, Ser. No. 951,918
Int. Cl.² G01R 27/02
U.S. Cl. 324—65 CR **16 Claims**



1. Apparatus for compensating for temperature variations in an electrical resistance corrosion measurement system, wherein at least two electrically conducting resistance elements are disposed in a corrosive atmosphere, a first element being the active element, a second element being a reference element, said first and second elements being electrically connected so that a supplied signal from electrical instrumentation induces a measurable signal across each resistance element, said measurable signal across said active element being proportional to corrosion of said active element, said measurable signal across said reference element being substantially proportional to the temperature of said corrosive atmosphere, said apparatus comprising:

means for sampling a signal which varies with changes in temperature to provide a reference signal;

means for converting said reference signal to the same base reference as the base reference of the uncompensated system output to provide a converted signal;

means for transforming said converted signal to an equivalent signal form of the uncompensated system output to provide an equivalent signal; and

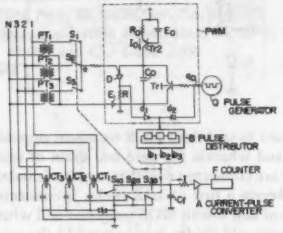
means for combining said equivalent signal and said uncompensated system output whereby the degrading effect of all temperature variations in said corrosion measuring system is eliminated from the net resulting output.

4,217,545

ELECTRONIC TYPE POLYPHASE ELECTRIC ENERGY METER

Shoji Kusui, Soka; Nobuyasu Yamazaki, Zushi, and Yoshio Ikeda, Kanagawa, all of Japan, assignors to Nihon Denki Keiki Kenteisho, Tokyo, Japan

Filed Jun. 20, 1975, Ser. No. 588,938
Int. Cl.² G01R 21/06, 11/16
U.S. Cl. 324—107 **8 Claims**



1. An electronic wattmeter circuit arrangement for providing an output current proportional to the sum of the power of each phase of an energized a.c. polyphase power system, said circuit arrangement comprising:

(a) a pulse generator for producing rectangular clock pulses at a repetition rate substantially greater than that of the energizing frequency of said power system;

(b) phase voltage sampling means including a plurality of first electronic switches, each first switch being associated with a respective phase of said polyphase power system and being operable for the duration of a control pulse fed thereto to supply a voltage sample of said duration from its said respective phase to a first common terminal;

(c) a pulse width modulator connected to said pulse generator for receiving said clock pulses therefrom as a carrier input, said modulator being connected to said first common terminal for receiving the phase voltage samples supplied thereto as a modulating input, whereby the pulse width modulator produces for each clock pulse a modulator output pulse the width of which is modulated according to the voltage value of the phase voltage sample then being supplied to said first common terminal;

(d) phase current sampling means including a plurality of second electronic switches, each second switch being associated with a respective phase of said polyphase power system and being operable for the duration of a control pulse fed thereto to supply a current sample of said duration from its respective phase to a second common terminal;

(e) a pulse distributor connected to said modulator and pulse generator for receiving said modulator output pulses and said clock pulses and, in response thereto, serially supplying a switch-operating control pulse to the corresponding pairs of said first and second switches in synchronism with the clock pulse repetition rate, whereby the operation of one corresponding pair of switches is followed in time sequence by the operation of each of the other corresponding pairs of switches; and

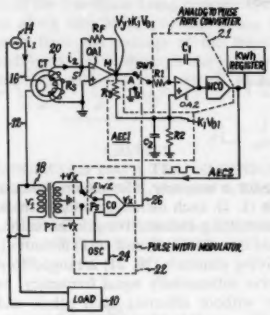
(f) means for obtaining the average value of the phase current samples supplied by said second switches to said second common terminal, said average value being the desired output current proportional to the sum of the power of each phase.

4,217,546

ELECTRONIC ENERGY CONSUMPTION METER AND SYSTEM WITH AUTOMATIC ERROR CORRECTION

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed Dec. 11, 1978, Ser. No. 967,964
Int. Cl.[3] G01R 21/06
U.S. Cl. 324—142 7 Claims



1. An improved electronic meter of the type for monitoring electrical energy consumption in a load, whereby the consumption is represented by electric current and voltage signals according to the time-division or amplitude-mark-space-modulation method comprising:

(a) a first transformer having a primary winding connected to receive one of the signals to be monitored and a secondary winding providing a first signal proportional thereto;

(b) a second transformer having a primary winding connected to receive the remaining one of the signals to be monitored and a secondary winding providing a second signal proportional thereto;

(c) a transresistance amplifier for terminating the secondary winding of said second transformer and serving as an active load which virtually short circuits the latter secondary winding while supplying an output signal having an AC component proportional to the primary current of said second transformer and which possesses a DC offset error component generated by said transresistance amplifier;

(d) a pulse-width modulator operatively connected to receive the first signal from said first transformer for producing repetitive modulated output pulse signals having instantaneous pulse-widths proportional to the corresponding instantaneous magnitude of said first signal;

(e) an analog to pulse rate converter including an integrating operational amplifier having first and second input terminals and an output terminal, said operational amplifier possessing high common mode rejection characteristics to signals applied to the input terminals thereof;

(f) a switch operatively connected to be automatically switched between first and second states in response to said repetitive modulated output pulse signals, said switch having a first input terminal connected to receive the output signal from said transresistance amplifier, a second input terminal connected to a potential source and an output terminal connected to the first input terminal of said operational amplifier; and

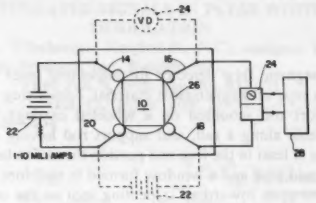
(g) an offset error voltage correction network connected between the output of said transresistance amplifier and the second input terminal of said operational amplifier for rejecting the alternating current component of the output signal of said transresistance amplifier to apply only the offset error voltage component to the second input terminal of said operational amplifier, whereby the offset error voltage in the output signal of said trans-resistance amplifier is automatically compensated for, due to the common mode rejection characteristics of the operational amplifier, in said analog to pulse rate converter as said switch is switched between said first and second states to alternately connect the first and second input terminals respectively of said switch to the first input terminal of said operational amplifier to provide a unit-energy output pulse from said analog to pulse rate converter each time a predetermined fixed unit amount of energy has been consumed by said load.

4,217,547

METHOD FOR DETERMINING THE COMPENSATION DENSITY IN N-TYPE NARROW-GAP SEMICONDUCTORS

Filbert J. Bartoli, Upper Marlboro, Md.; Leon Esterowitz, Springfield; Roger E. Allen, Alexandria, both of Va., and Melvin R. Kruer, Oxon Hill, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 13, 1979, Ser. No. 11,821
Int. Cl.[2] G01R 31/26, 27/02
U.S. Cl. 324—158 R 5 Claims



1. A nondestructive optical technique for determining the compensation density of narrow-gap semiconductors which comprises:

fabricating a semiconductor sample material on a nonconductive substrate to include electrical contacts at the corners of the semiconductor material;

cooling said semiconductor sample;

directing uniformly over the surface area of said semiconductor sample a laser pulse of such a wavelength that the photon energy is greater than the band gap of the sample;

measuring and recording the conductivity voltage for a given combination of electrical contacts of said sample;

repeating the above conductivity voltage measurements for each combination of electrical contacts and voltage source polarity and obtaining an average conductivity voltage curve from all data obtained;

directing a magnetic field perpendicularly to the surface area of said sample;

directing uniformly over the surface area of said semiconductor sample a laser pulse of such a wavelength that the photon energy is greater than the band gap of the sample;

measuring and recording the Hall-voltages during and after the laser pulse for each pair of electrical contacts, for the magnetic field in each direction perpendicular to the surface area and for each polarity of said source;

obtaining an average Hall-voltage curve from all recorded Hall-voltage curves;

from the average Hall-voltage curve and average conductivity voltage curve obtained, preparing a mobility vs carrier density curve; and

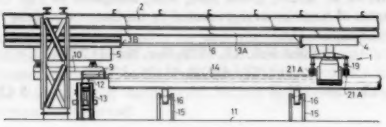
comparing the obtained mobility vs carrier density curve with a family of previously calculated curves with different compensation densities designating different qualities of materials to obtain a match, thereby designating the quality of the material of the sample.

4,217,548

FLAW DETECTOR FOR PIPE EMPLOYING MAGNETS LOCATED OUTSIDE THE PIPE AND DETECTOR MOUNTED INSIDE AND MOVABLE ALONG THE PIPE WITH THE MAGNETS

Yasuyuki Furukawa; Yoshihisa Fujii; Hitoshi Tanaka, all of Wakayama, and Tetsuya Hirota, Amagasaki, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 809,829, Jun. 24, 1977, abandoned. This application Dec. 12, 1978, Ser. No. 968,703
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—220 5 Claims



1. A magnetic flaw detector for inspecting inner wall surfaces of a pipe of magnetizable material, comprising:

a support rod mounted on a wheeled carriage which is movable along a rail, said support rod having a hollow space at least in the fore end portion thereof to be inserted into said pipe and a window formed in said fore end portion to open toward an inspecting spot on the inner wall surface of said pipe;

a detector assembly having a base plate accommodated within said hollow space at the fore end of said support rod and movable radially of said support rod, a plural number of detecting members mounted on said base plate in alignment in the longitudinal direction of said support rod, each one of said detecting members having magneto-sensitive element urged by respective biasing means to project independently through said window toward the inner wall surface of said pipe, and a plural number of guide rollers mounted on said base plate and adapted to be brought into rolling contact with the inner wall surface of said pipe to support said base plate when said detecting members are abutted against the inner wall surface of said pipe;

a guide mechanism having a support frame attached to the distal end of said support rod and swingable in a direction opposite to the projecting direction of said magneto-sensitive elements, and a guide roller adapted to be brought into rolling contact with the inner wall surface of said pipe to support said support rod when said support frame is swung out;

a magnetizing assembly having a magnetizing head reciprocably mounted toward and away from the outer surface of said pipe, on a wheeled carriage movable with the first-mentioned wheeled carriage to move said magnetizing head longitudinally along the outer wall surface of said pipe, exciting magnets mounted on said magnetizing head in a position closely opposing said magneto-sensitive elements across the wall of said pipe, and follower rollers adapted to be brought into rolling contact with the outer wall surface of said pipe to support said exciting magnets in an operating position close to the outer wall surface of said pipe; and

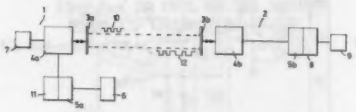
means for rotating said pipe about the axis thereof during the flaw detecting operation by said detecting and magnetizing assemblies.

4,217,549

DEVICE FOR TWO-WAY INFORMATION LINK

Bengt Henoch, Hägersten, Sweden, assignor to Stiftelsen Institutet för Mikrovagsteknik vid Tekniska Hogskolan I Stockholm, Stockholm, Sweden

Filed Sep. 9, 1977, Ser. No. 831,988
Claims priority, application Sweden, Sep. 24, 1976, 7610604
Int. Cl.[2] H04B *7/00;* H01Q *13/00*
U.S. Cl. 455—81 4 Claims



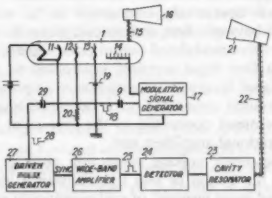
1. A device for a two-way information link, comprising at least two units (1, 2), each including transmitter and receiver means for transmitting and receiving information, characterized in that said means in each unit (1, 2) includes (a) transmitting and receiving elements (20, 21) arranged to respectively emit and receive substantially equal frequency, orthogonally related waves without affecting each other, and (b) wave transformation means (24, 34) (i) for transforming the wave emitted by said transmitting element into a transmit wave system (10) that is propagated from said transmitter and receiver means in orthogonal relation to a corresponding wave system (12) arriving at said transmitter and receiver means for reception and (ii) further for transforming said corresponding wave system into a wave that is directed to and receivable by said receiving element, the wave systems (10, 12) propagated by the transmitter and receiver means of the two units (1, 2) being of at least substantially equal frequency, the transmit wave system (10, 12) provided by said wave transformation means in each of said units (1, 2) being a circular polarized wave, the polarization of the circular waves provided by said units (1, 2) being opposite to one another as seen from one of said units (1, 2), the transmitting element in each unit (1, 2) being a transmitter diode (30), and the receiving element in each unit (1, 2) being a receiver diode (31) connected to an aerial (35), said aerial (35) comprising a mat (36) formed from electrically non-conductive material and provided with electric conductive elements, which are arranged in rows (37) and columns (38), spaced from but electrically connected to each other.

4,217,550

RADIO JAMMING DEVICE

Pierre P. Blassel, and Paul M. Jacquet, both of Paris, France

Filed Sep. 28, 1962, Ser. No. 226,792
Int. Cl.[2] H04K *3/00*
U.S. Cl. 455—1 4 Claims



1. A jamming device adapted to jam a given frequency band with the exception of a particular jam-free band included in said given frequency band, comprising a transmitter tube generating a radiofrequency carrier signal, means for blocking said tube, means for frequency-modulating said carrier signal, means connected to said frequency-modulating means for generating a modulation signal having an amplitude versus

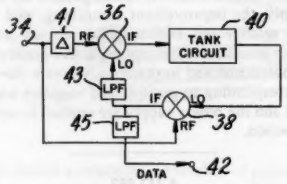
time waveform including a first saw-tooth and a second saw-tooth, both having two portions in which respectively the amplitude of the modulation signal increases and decreases with respect to time, and a linear portion in which the amplitude of the modulation signal abruptly varies from the amplitude value at the end of the first saw-tooth to the amplitude value at the beginning of second saw-tooth, the variation direction of the modulation signal amplitude on both sides of the linear portion of the waveform being opposite the direction of said variation along said linear portion, means for deriving blocking signals from the passage of the frequency of the frequency-modulated signal through the jam-free band and means for applying said blocking signals to said blocking means.

4,217,551

PHASE MODULATED DATA TRANSMISSION SYSTEM

Alan Entenman, Hicksville, N.Y., assignor to Intech Laboratories, Inc., Bohemia, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,394
Int. Cl.[2] H04B *1/16;* H03D *3/00*
U.S. Cl. 375—88 **12 Claims**



1. Apparatus for demodulating a phase-shift modulated carrier to derive data representative signals, comprising:

means, responsive to said data representative signals, for phase shifting said modulated carrier for deriving an unmodulated carrier;

means for sustaining said unmodulated carrier during phase changes of said modulated carrier;

and phase detecting means, responsive to said sustained unmodulated carrier and said modulated carrier, for generating said data representative signals,

wherein said unmodulated carrier deriving means includes means connected to said phase detecting means and responsive to said data representative signals and said modulated carrier for selectively changing the phase of said modulated carrier dependent upon the value of said data representative signal for deriving said unmodulated carrier.

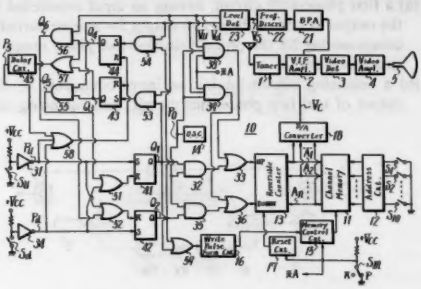
4,217,552

RECEIVER

Takao Mogi, Tokyo; Koji Morita, Kodaira, and Hisao Okada, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 15, 1978, Ser. No. 942,531
Claims priority, application Japan, Sep. 28, 1977, 52-116375
Int. Cl.[2] H04B *1/32*
U.S. Cl. 455—164 **11 Claims**

4. An automatic tuning receiver for tuning a radio frequency signal comprising: an electronic tuner, an intermediate frequency amplifier having a bandwidth, sweeping means for sweeping the tuning frequency of said tuner in a unidirectional sweep past said radio frequency signal, means for automatic fine tuning said electronic tuner, said means for automatic fine tuning being operative to produce first and second sequential fine tuning signals within a predetermined time in response to sweeping said radio frequency signal past a fixed frequency within said bandwidth, stopping means for stopping said sweeping means in response to the sequential production of said first and second fine tuning signals, and inhibiting means



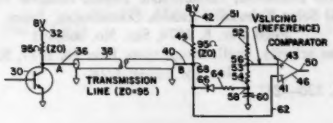
for inhibiting said stopping means when said second signal does not occur within said predetermined time.

4,217,553

DYNAMIC SLICING COMPENSATION FOR ATTENUATED SIGNALS IN PULSE WIDTH MODULATION

Joseph P. Winebarger, Knightdale, N.C., assignor to Telex Computer Products, Inc., Raleigh, N.C.

Filed Jun. 5, 1978, Ser. No. 912,471
Int. Cl.[2] H03K *5/08, 5/153*
U.S. Cl. 328—164 **2 Claims**



1. Dynamic slicing compenation means for detecting attenuated pulse width modulation signals, in noise, at the receiving end of a transmission means, comprising:

(a) comparator means having a non-inverting first input and a an inverting second input, and an output; and means to connect the second input to said receiving end of said transmission means;

(b) a voltage source of selected magnitude of voltage connected through a resistor of selected magnitude of resistance, to said receiving end of said transmission means;

(c) a bypass circuit connected from said voltage source to said receiving end, comprising in series;

1. a first resistor to a first junction point;
2. a second resistor from said first junction point to a second junction point;
3. a third resistor connected from said second junction point through a diode to said receiving end;

(d) a capacitor of selected magnitude of capacitance connected from said second junction point to ground; and

(e) said first junction connected to the first input of said comparator.

4,217,554

CIRCUITS FOR REDUCING INTERMODULATION NOISE

Henri Brzozowski, Colombes, France, assignor to Societe Anonyme, Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

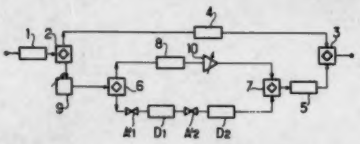
Filed Jan. 9, 1979, Ser. No. 2,092
Claims priority, application France, Jan. 25, 1978, 78 02006
Int. Cl.[2] H03F *1/26, 3/68*
U.S. Cl. 330—124 R **7 Claims**

1. Apparatus for reducing the intermodulation noise gener-

ated in a chain of amplifiers, said apparatus being designed for connection to the output of said chain and comprising:

(a) a first phase-shift circuit, having an input connected to the output of said chain and an output for at least partially compensating for the phase distortion and phase jumps in said chain; and

(b) a balancing circuit having an input connected to the output of said first phase-shift circuit, said balancing circuit including a source of compensation noise comprising: (1) a series of amplifiers each having the non-linearity defects of one of the amplifiers in said chain; and (2) a plurality of second phase-shift circuits interposed between respective adjacent pairs of said amplifiers, said second phase-shift circuits causing said series of amplifiers to exhibit, to the nearest $2K\pi$, $K=1, 2, 3 \ldots$, the same phase law exhibited by said chain of amplifiers.

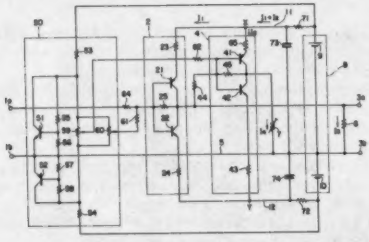


4,217,555

AMPLIFIER CIRCUIT ARRANGEMENT WITH STABILIZED POWER-SUPPLY CURRENT

Masayuki Iwamatsu, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 8, 1978, Ser. No. 968,431
Claims priority, application Japan, Dec. 16, 1977, 52/151521
Int. Cl.² H03F 3/18
U.S. Cl. 330—267 **6 Claims**



1. An amplifier comprising:

a first single-ended complementary push-pull amplifying circuit operating in class A mode with a first operating current and having an input receiving an input signal to said amplifier and an output;

a second single-ended complementary push-pull amplifying circuit comprising an inverting amplifier circuit operating in class A mode with a second operating current and having an input connected to the output of said first amplifying circuit and an output;

a balanced power supply circuit common to said first and second amplifying circuits for supplying said first and second operating currents and having an electrically neutral point connected to a ground line of said amplifier, so that the total current supplied from said power supply circuit to said amplifying circuits is maintained constant;

a first load connected between the output of said first amplifying circuit and said ground line; and

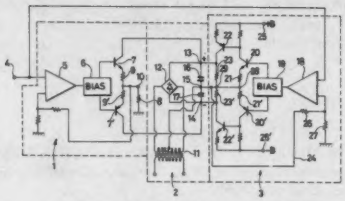
a second load connected between the output of said second amplifying circuit and said ground line.

4,217,556

OUTPUT AMPLIFYING CIRCUIT

Hideo Ito, and Yoshihiro Kawanabe, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 8, 1978, Ser. No. 967,756
Claims priority, application Japan, Dec. 8, 1977, 52-147643
Int. Cl.² H03F 3/21
U.S. Cl. 330—268 **10 Claims**



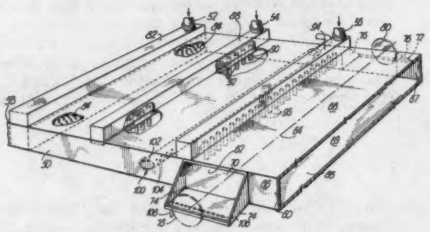
1. In an output amplifying circuit having a Push Pull amplifier section, a power supply circuit section coupled to the Push Pull amplifier and an amplifier circuit section for amplifying a power supply, the improvement comprising; said power supply circuit section and said amplifier circuit section being connected in parallel and having respective positive and negative terminals connected in common wherein the sum of the outputs corresponding to positive and negative sections of an input signal and the power supply are applied to said Push Pull amplifier section.

4,217,557

LASER EMISSION FROM PURELY CHEMICALLY GENERATED VIBRATIONALLY EXCITED HYDROGEN BROMIDE

Kenneth D. Foster, LacBeauport, and Sara J. Arnold, Loretteville, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jun. 5, 1978, Ser. No. 912,406
Claims priority, application Canada, Apr. 5, 1978, 300541
Int. Cl.² H01S 3/22
U.S. Cl. 331—94.5 G **8 Claims**



1. A method for producing continuous laser activity comprising:

injecting reactant gases consisting essentially of nitric oxide, chlorine dioxide, hydrogen iodide, and molecular bromine in a flow path upstream from an optical resonator cavity in which said laser activity occurs, whereby the nitric oxide reacts with the chlorine dioxide to produce chlorine atoms, the molecular bromine reacts with the chlorine atoms to generate atomic bromine, and the atomic bromine reacts with the hydrogen iodide to produce vibrationally excited hydrogen bromide, purely chemically; and

provided that the nitric oxide is injected separately from the

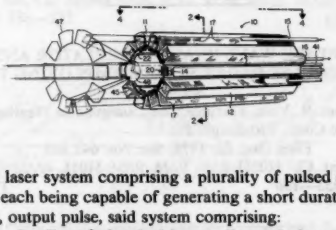
chlorine dioxide, the said vibrationally excited hydrogen bromide is initially formed so that the population of some energy states is inverted so as to enable subsequent chemical laser activity and the sequence of injection of hydrogen iodide is such that the reaction of said hydrogen iodide with the atomic bromine is in a time period which is less than the time period for a loss of 63% of the atomic bromine by recombing into molecular bromine.

4,217,558

PULSED CHEMICAL LASER SYSTEM

Robert Aprahamian, Marina del Rey, and Joseph Miller, Tarzana, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 3, 1976, Ser. No. 663,404
Int. Cl.[2] H01S *3/05, 3/08, 3/09*
U.S. Cl. 331—94.5 C **8 Claims**



1. A laser system comprising a plurality of pulsed chemical lasers, each being capable of generating a short duration, high power, output pulse, said system comprising:
(a) a plurality of chemical lasers, disposed about a central axis, each of said lasers comprising:
(b) an elongated chamber;
(c) means for feeding a chemical fuel into said chamber and for exhausting the combusted fuel;
(d) means for initiating a chemical reaction of the fuel in said chamber;
(e) means for preionizing the fuel;
(f) means for cyclically initiating the chemical reaction in each laser and for cyclically preionizing the fuel in said chamber in such a manner that successive laser pulselets with substantially consecutive time durations are generated in respective ones of said lasers; and
(g) optical means including a plurality of reflectors for defining an optical cavity in each of said lasers along said axis and for combining the output laser pulselets.

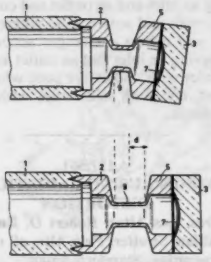
4,217,559

METHOD OF ADJUSTING GAS LASER MIRROR

Hans G. Van den Brink, Eindhoven; Albertus J. F. M. Van Hoof, Weert; Johannes H. K. C. Van Kleef, and Theodorus F. Lamboo, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,576
Claims priority, application Netherlands, Apr. 5, 1977, 7703686
Int. Cl.[2] H01S *3/086*
U.S. Cl. 331—94.5 C **1 Claim**

1. A method of adjusting an optical element of a gas discharge laser, which element is secured to one end of a tubular metal support with the support in turn secured to the laser tube, which comprises adjusting the optical element by mechanical deformation of a tubular section of the tubular metal support, and drawing the tubular section beyond the yield



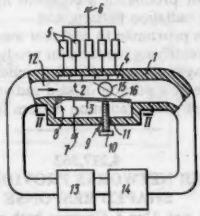
point of the metal of the tubular section throughout the circumference during or after adjustment of the optical element.

4,217,560

GAS LASER

Felix K. Kosyrev, ulitsa Tsentralnaya, 14, kv. 27, Troitsk Moskovskoi oblasti; Valery A. Timofeev, ulitsa Zavodskaya, 9/1, kv. 14; Anatoly K. Pekh, ulitsa Fevralskaya, 6, kv. 6, both of Klimovsk Moskovskoi oblasti, and Alexandr P. Leonov, Leninsky raion Mosrentgen, 19, kv. 37, Moskovskaya oblast, all of U.S.S.R.

Filed Apr. 21, 1978, Ser. No. 898,972
Claims priority, application U.S.S.R., Apr. 25, 1977, 2479581
Int. Cl.[2] H01S *3/02*
U.S. Cl. 331—94.5 D **2 Claims**



1. A gas laser comprising:
a housing with a threaded hole;
a gas mixture passed through said housing;
a first electrode composed of a plurality of sections and accommodated in said housing;
a group of ballast resistors;
each ballast resistor of said group of ballast resistors having a first lead and a second lead and connected with its first lead to one of the sections of said plurality of sections of said first electrode;
said second leads of said ballast resistors of said group of ballast resistors being interconnected and forming a first input of said gas laser;
a second electrode accommodated in said housing, opposite said first electrode on the side of said plurality of sections;
one of said first and second electrodes being secured in said housing by means of an articulated joint which makes it possible to vary the spacing between said first and second electrodes in the direction of said gas mixture flow, while the laser is provided with a means to adjust the deflection of the electrode which is secured in said housing by means of said articulated joint;
an active zone, where the laser effect is produced, located between said first and second electrodes, wherethrough said gas mixture is passed;

a cavity having an optical axis traversing said active zone where the laser effect is produced;

a gas mixture pumping means accommodated in said housing, having an inlet and an outlet and communicating with said outlet with said active zone where the laser effect is produced; and a heat exchanger accommodated in said housing, having an inlet and an outlet and communicating with said inlet with said active zone where the laser effect is produced, and with said outlet with said gas mixture pumping means.

4,217,561

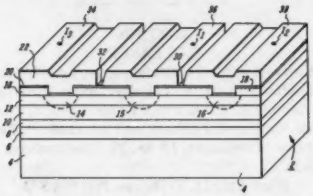
BEAM SCANNING USING RADIATION PATTERN DISTORTION

Donald R. Scifres, Los Altos; Robert D. Burnham, Los Altos Hills, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 26, 1978, Ser. No. 918,743

Int. Cl.[2] H01S 3/19

U.S. Cl. 331—94.5 H **6 Claims**



1. A light beam scanner for scanning a single-lobe radiation pattern comprising:

first means for producing a coherent light beam having a single-lobe radiation pattern, and

second means proximate to said first means and including a solid state rectifying junction for producing an electrically variable asymmetric refractive index profile through which at least a portion of said radiation pattern propogates whereby said radiation pattern is scanned.

4,217,562

EQUALIZER NETWORKS PROVIDING A BUMP SHAPED RESPONSE

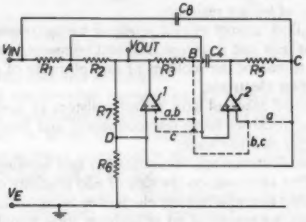
John M. Rollett, and Alan J. Greaves, both of Ipswich, England, assignors to The Post Office, London, England

Filed Aug. 28, 1978, Ser. No. 937,527

Claims priority, application United Kingdom, Sep. 7, 1977, 37358/77

Int. Cl.[2] H03H 7/16, 7/44

U.S. Cl. 333—28 R **9 Claims**



1. An active equalizer network including first and second differential input operational amplifiers, an input terminal, an output terminal, a reference terminal, a first, a second, a third and a fourth junction point;

said first junction point being connected via a first resistance element to the input terminal, and connected via a second resistance element to the output terminal of the first operational amplifier, and connected to the non-inverting input terminal of the second operational amplifier;

said second junction point being connected via a third resistance element to the output terminal of the first operational amplifier and connected via a first capacitance element to the output terminal of the second operational amplifier;

said third junction point being connected via a fourth resistance element to the output terminal of the second operational amplifier, and connected via a second capacitance element to the input terminal, and connected to the non-inverting input terminal of the first operational amplifier;

said fourth junction point being connected via a fifth resistance element to the output terminal of the first operational amplifier, and connected via a sixth resistance element to the reference terminal, and connected to the non-inverting input of the first operational amplifier;

said output terminal being connected to the output terminal of the first operational amplifier; and

the inverting input terminal of the first operational amplifier being connected to the second junction point and the inverting input terminal of the second operational amplifier being connected to the third junction point.

4,217,563

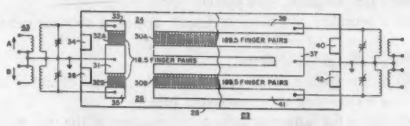
SURFACE WAVE PHASE CORRELATOR AND MONOPULSE RADAR SYSTEM EMPLOYING THE SAME

Christopher R. Vale, Elkridge, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 642,802

Int. Cl.[2] H03H 9/30, 9/26, 9/04; H01L 41/22

U.S. Cl. 333—150 **1 Claim**



1. A method for making a surface wave phase correlator device having a common substrate member with at least a top layer portion thereof formed from piezoelectric material, a first pair of launching electrode means disposed on the top surface of said substrate member and spaced from each other in a first direction over the surface, a first pair of receiving electrode means disposed on the top surface of said substrate member and spaced from said first launching electrode means pair in a second surface wave travel direction and from each other subtantially tranversely of the wave travel direction in the first surface direction, a second pair of launching electrode means disposed on the top surface of said substrate member and spaced from each other in the first surface direction and aligned with said first launching electrode means pair in the first surface direction, a second pair of receiving electrode means disposed on the top surface of said substrate member and spaced from said second launching electrode means pair in the wave travel direction and from each other and from said first receiving electrode means pair in the first surface direction, a first plurality of launching electrode finger pairs interdigitated between said first launching electrode means to provide a predetermined center pass frequency for said first launching and receiving electrode means pair, another plurality of launching electrode finger pairs interdigitated between said second launching electrode means and substantially identical in structure with said first plurality of launching electrode finger pairs, and a second plurality of receiving electrode finger pairs interdigitated between said first receiving electrode means pair, and another plurality of receiving electrode finger pairs interdigitated between and receiving electrode means and substantially identical in structure with said second

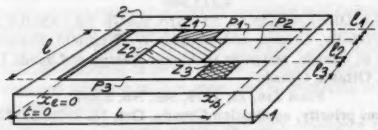
plurality of receiving electrode finger pairs, said method comprising the steps of marking at least a magnification of the electrode finger structure on a transparency by means of a computer controlled graphic system, employing the graphic system in the marking step to make successive common passes over the transparency in a given direction and in each pass marking corresponding electrode fingers in the first and second launching electrode means or corresponding electrode fingers in the first and second receiving electrode means, marking any additionally needed electrode structure on the transparency, photoreducing the transparency to the masking size required for electrode disposition on the substrate operating surface, and disposing conductive material on the device operating surface in accordance with the mask resulting from the photoreduction processing.

4,217,564

ELASTIC SURFACE WAVE DEVICE FOR TREATING HIGH FREQUENCY SIGNALS

Jean-Michel Autran, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 15, 1978, Ser. No. 942,622
Claims priority, application France, Sep. 20, 1977, 77 28303
Int. Cl.[2] H03H *9/30, 9/32, 9/26;* H01L *41/10*
U.S. Cl. 333—152 **12 Claims**



1. An elastic surface wave device for treating high frequency waves forming a filter having a transfer function T(F) of which the inverse Fourier transform I (t), which is the pulse response of the filter, comprises n pulses identical in sign, phase-shifted relative to one another and of various amplitudes which comprises:

A material for propagating said surface waves at a predetermined velocity v, on a useful propagation surface;

input means delivering a front of acoustic waves to be treated to one end, the so-called input end, of the said useful propagation surface of said material;

means, combined with said useful surface, for creating interruptions in propagation in zones where the propagation velocity v' is different from that v of said material, said zones delimiting n parallel tracks for propagating the elastic waves issuing from said wave front, the width of said zones being proportional to the amplitude of said n pulses and their relative lengths being proportional to the relative phase shifts of said pulses.

4,217,565

HYBRID T-JUNCTION SWITCH

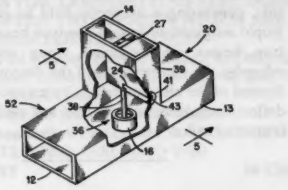
Edward Salzberg, 19 Black Oak Rd., Wayland, Mass. 01778

Filed Dec. 26, 1978, Ser. No. 973,245
Int. Cl.[2] H01P *1/15*
U.S. Cl. 333—258 **8 Claims**

1. A microwave hybrid T-junction in which energy introduced at one of the main arms is blocked or passed to the other main arm by changing the state of a variable impedance in one of the branch arms comprising:

(a) a waveguide body having a first main arm, a second main arm, a first branch arm and a second branch arm, one said branch arm being an E-plane arm and the other being an H-plane arm;

(b) a variable impedance located in said first branch arm variable between a high impedance state and a low impedance state by application of an electrical control signal, said variable impedance arranged so as to change the phase of wave energy reflected in said first branch arm at the design frequency by 180 degrees when said variable impedance changes impedance states;



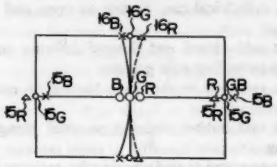
(c) a short circuit of conductive material across said second branch arm at a location providing a maximum energy transfer condition between the first and second main arms at a design frequency bandwidth for one condition of said variable impedance.

4,217,566

IN-LINE TYPE COLOR PICTURE TUBE APPARATUS

Eizaburo Hamano; Hisafumi Okada, both of Kumagaya, and Hidetoshi Yamazaki, Fukaya, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 23, 1978, Ser. No. 908,852
Claims priority, application Japan, May 30, 1977, 52-62222
Int. Cl.[2] H01F *3/12*
U.S. Cl. 335—212 **5 Claims**



1. An in-line type color picture tube apparatus, comprising:

an in-line type color picture tube including a phosphor screen for displaying a substantially rectangular picture with horizontal, vertical, and diagonal axes and an in-line electron gun arranged in parallel with said horizontal axis so as to be allowed to cast electron beams on said phosphor screen to reproduce a color image;

a deflection yoke disposed around the outer periphery of said tube and generating a magnetic field to give positive isotropic astigmatism to said electron beams when said electron beams are deflected along said horizontal axis, to give negative isotropic astigmatism to said electron beams when said electron beams are deflected along said vertical axis, and to give negative anisotropic astigmatism to said electron beams when said electron beams are deflected along said diagonal axis, the magnetic field generated by the deflection yoke providing the state of non-conver-

gence along at least one of said horizontal axis, vertical axis and diagonal axis;

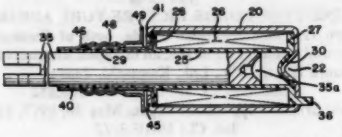
a correction deflection element formed of a plurality of permanent magnets arranged in the vicinity of the end portion of said deflection yoke on the phosphor screen side, generating a magnetic field to give positive anisotropic astigmatism to said electron beams when said electron beams are deflected along said diagonal axes, whereby the end portions of the diagonal axes of a raster formed of the electron beams by means of an action of the deflection yoke are constricted and said non-convergence is countervailed.

4,217,567

TUBULAR SOLENOID

Kenneth L. Roy, Centerville, and William D. Sadgebury, New Carlisle, both of Ohio, assignors to Ledex, Inc., Vandalia, Ohio

Filed Sep. 18, 1978, Ser. No. 943,110
Int. Cl.[2] H01F *3/00, 7/08*
U.S. Cl. 335—255 **9 Claims**



1. A tubular solenoid comprising:

a drawn cylindrical case having an open end and a closed end,

means at said closed end thereof defining an integral inwardly extending pole portion;

a bobbin received in said case having an energizing coil thereon;

means in said bobbin defining an axial plunger receiving opening,

a plunger received in said opening for reciprocal movement therein,

means in said bobbin defining an integral wall positioned in abutting relation to the inside surface of said pole portion forming a stop surface for said plunger and spacing said plunger from said pole portion,

said bobbin further having an integral forward portion extending axially of said case through said open end thereof, and

solenoid mounting means associated with said axially extending forward portion.

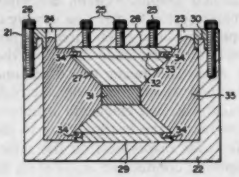
4,217,568

MAGNETIC POLE PIECES FOR USE IN A NUCLEAR MAGNETIC RESONANCE APPARATUS

Akio Chiba; Hiromichi Imahashi, both of Hitachi; Sadami Tomita, and Yoshiharu Utsumi, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 1, 1977, Ser. No. 847,491
Claims priority, application Japan, Nov. 4, 1976, 51/131765
Int. Cl.[2] H01F *3/00, 7/00*
U.S. Cl. 335—298 **13 Claims**

1. In a magnetic field generating device for providing a uniform magnetic field in a gap in a magnetic apparatus, the improvement comprising a single integrated pole piece means having a couple of pole pieces opposite to each other, said pole pieces being parallel to and spaced from each other, and in faced alignment relation to each other, to provide said gap, and a casting material of non-magnetic metal being integral and in a direct contact relation to surfaces of both the pole pieces with the exception of at least gap-defining surfaces on said pole



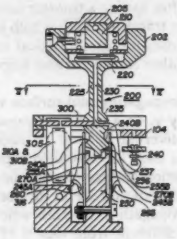
pieces, whereby the casting material integrally fixes the couple of pole pieces to each other.

4,217,569

THREE DIMENSIONAL STRAIN GAGE TRANSDUCER

Peter Nejedly, Ottawa, and Douglas W. Whitfield, Stittsville, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Jan. 23, 1979, Ser. No. 5,802
Claims priority, application Canada, Oct. 18, 1978, 313729
Int. Cl.[2] G01L *1/22*
U.S. Cl. 338—2 **5 Claims**



1. A three dimensional strain gauge transducer comprising:

(a) a body member,

(b) a joystick pivoted on said body member for limited movement from a neutral position in first and second substantially perpendicular directions and limited rotation about the axis thereof, said first and second directions and said rotation being in relation only to said body member, said joystick having a first end defining a manually operable knob and a second end defining spring engaging means,

(c) a first pair of spring means engageable and deformable by said engaging means in response to movement in said first direction,

(d) a second pair of spring means engageable and deformable by said engaging means in response to movement in said second direction,

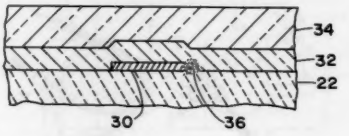
(e) a third pair of spring means engageable and deformable by said engaging means in response to said rotation, said first, second and third spring means respectively urging said joystick to said neutral position, and

(f) associated pairs of strain gauge elements mounted on the first, second and third pairs of springs.

4,217,570
THIN-FILM MICROCIRCUITS ADAPTED FOR LASER TRIMMING

Robert E. Holmes, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed May 30, 1978, Ser. No. 910,178
Int. Cl.[2] H01C 7/00; B23K 26/00
U.S. Cl. 338—308 **5 Claims**



1. A microcircuit structure comprising

a substrate,

a thin-film electrical component disposed on said substrate, said component being formed from a material containing a metal capable of reacting with silicon nitride at the temperature produced by laser trimming of the component to form a metal nitride having a dissociation temperature no higher than the first-mentioned temperature, and

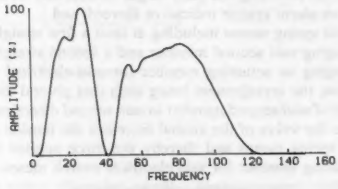
an unfractured protective coating covering said component and adjoining surface areas of the substrate, said coating including a layer of an oxide deposited to a minimum average thickness of about 1000 angstroms on said component and substrate surface areas, and an overlying layer of silicon nitride,

said structure including a relatively high resistance region within said oxide layer adjoining said component, said region being formed by laser trimming of the component through said protective coating and containing a stable reaction product of said metal with said oxide layer.

4,217,571
STUTTER SEISMIC SOURCE

Donald R. Hughes, Houston, Tex.; William H. Gumma, Lakewood, Colo., and Neil S. Zimmerman, New Orleans, La., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 16, 1978, Ser. No. 878,214
Int. Cl.[2] G01V 1/00, 1/04
U.S. Cl. 367—37 **20 Claims**



1. A method of seismic prospecting for overcoming dynamic range limitations of seismic signal recording systems, thereby allowing such systems to record higher quality signals across a broader range of frequencies, comprising the steps of:

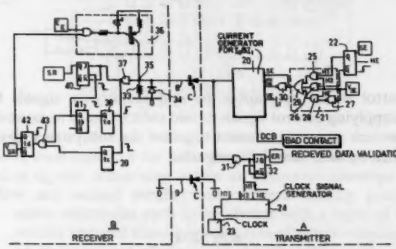
determining a peak impulsive transmission frequency of the earth,

generating two or more time-spaced seismic initiations near the surface of the earth, wherein the time spacing is picked in accordance with the frequency spectrum location of said earth peak transmission frequency to de-emphasize the transmitted energy at said peak transmission frequency so as to broaden and flatten the amplitude versus frequency spectrum of the seismic signal to be received, and recording reflections of said initiations from subsurface interfaces for a period of time after said initiation.

4,217,572
ARRANGEMENTS FOR TRANSMITTING ELECTRICAL SIGNALS BETWEEN TWO DEVICES WHICH ARE CONNECTED BY CONTACTS

Georges M. Giraud, Le Vesinet, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme), Paris, France

Filed Jun. 30, 1978, Ser. No. 920,690
Claims priority, application France, Jul. 7, 1977, 77 20972
Int. Cl.[2] H04L 7/00; H04Q 9/00
U.S. Cl. 340—147 SY **14 Claims**



1. A system for bidirectional transmission of electrical signals between a transmitter circuit and a receiver circuit which are temporarily interconnected by physical contacts during the whole of the transmission period to allow digital data to be exchanged between the two circuits and to allow the transmitter circuit to transmit synchronizing clock pulses to the receiver circuit comprising current generating means in the transmitter circuit for generating a first and a second current, means for producing a data signal to be transmitted by the transmitter circuit by modulating the duration of the two currents, said currents being of different intensities, said modulation operating in one of two modes depending upon whether a 0 bit or a 1 bit is to be transmitted, means in the receiver circuit for generating a current, means for producing a data signal to be transmitted by the receiver circuit to the transmitter circuit by amplitude modulation of the current generated in the receiver circuit, said last named modulation operating with two intensities of predetermined value which are assigned in one case to a 0 bit and in the other to a 1 bit, the duration of the current pulses being controlled by the said synchronizing signal and contact means interconnecting said transmitter circuit and said receiver circuit.

4,217,573
SWITCHING UNIT FOR SELECTIVELY CONNECTING TOGETHER VARIOUS COMBINATIONS OF AUDIO SUBSYSTEMS

Elwood G. Norris, 1520 Canterbury Dr., Salt Lake City, Utah 84108

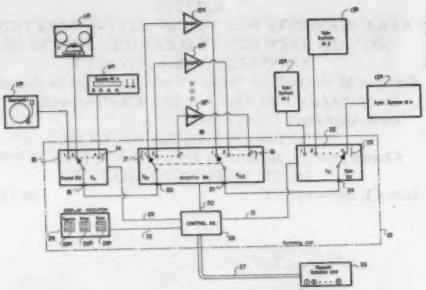
Filed Apr. 5, 1979, Ser. No. 27,253
Int. Cl.[2] H04Q 3/00
U.S. Cl. 340—147 R **14 Claims**

1. A switching unit for selectively coupling in series m electronic subsystems, where m is an integer greater than two, and where each subsystem in series is selected from a different one of m groups of subsystems, said unit comprising

a portable signal generating means of a size which may be held in a person's hand, said signal means being manually operable to produce signals identifying the subsystems to be coupled together,

switch means coupled to each subsystem in each group and

responsive to control signals for electrically connecting together selected subsystems from each group, and



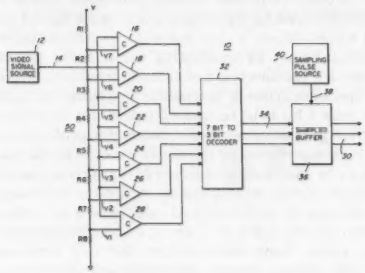
control means responsive to said identifying signals for supplying control signals to said switch means to cause the switch means to connect together the subsystems identified by said identifying signals.

4,217,574

ANALOG TO DIGITAL CONVERTER HAVING NONLINEAR AMPLITUDE TRANSFORMATION

Bruce C. Anderson, Tewksbury, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Aug. 9, 1976, Ser. No. 712,634
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD **7 Claims**



1. An analog to digital converter for converting an analog gamma corrected input video signal into a digital output signal which is a nonlinear function of the input signal, including:

(a) a plurality of analog comparators, each of the comparators receiving the analog input video signal at an input,

(b) reference signal means providing a different reference signal to another input of each of the plurality of comparators for amplitude comparison with the input signal, the amplitudes of the respective reference signals having a preselected nonlinear relationship such that the different reference signals vary by multiples of a fraction, of a common reference signal, raised to the γ power to remove the gamma correction from the video signal, the plurality of comparators providing a digital output that indicates which reference signal the amplitude of the input signal is greater than, and

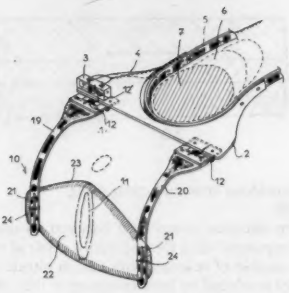
(c) means for decoding the continuous outputs of the plurality of comparators to form the digital output signal having a predetermined digital code.

4,217,575

PARTURITION WARNING DEVICES

Rene Lorette, Fleville, 08250 Grandpre, France

Filed Feb. 28, 1978, Ser. No. 882,950
Claims priority, application France, Mar. 9, 1977, 77 06909; Nov. 7, 1977, 77 33384
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—573 **16 Claims**



1. An animal parturition warning device comprising:

a crupper strap including a portion adapted to be passed under the tail of an animal;

a first member fixedly attached to said crupper strap for stable location beneath the tail but above the anus of the animal;

a second member depending from said first member and displaceable relative thereto about a pivotal axis alternatively in a first direction toward the animal and in a second direction away from the animal, said second member, when moved toward the animal, completely covering the vulva of the animal;

coil spring means, concentric with said pivotal axis between said first member and said second member, for constantly biasing said second member relative to said first member in said first direction into contact with the animal;

said second member being displaced relative to said first member in said second direction against the biasing force of said coil spring means by a positive issue from the vulva of the animal in the early stages of birth;

electrical switch means, positioned to be actuated by the displacement of said second member in said second direction, for detecting the early stages of birth and for activating an alarm system indicative thereof; and

said coil spring means including at least a first straight limb engaging said second member and a second straight limb engaging an actuating member for said electrical switch means, the arrangement being such that pivotal displacement of said second member in said second direction away from the vulva of the animal increases the tension in said coil spring means and thereby the force applied to said actuating member for said electrical switch means.

4,217,576

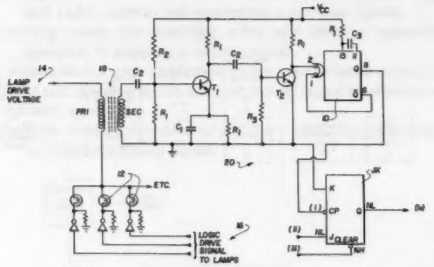
LAMP OPERABILITY TESTING DEVICE FOR PLAYING MACHINE

David Wreford-Howard, 17823 La Costa, Huntington Beach, Calif. 92647

Filed Mar. 28, 1978, Ser. No. 890,956
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—642 **8 Claims**

1. Detection means, for detecting the non-operability of a lamp, comprising: a circuit including selection means operable to receive and selectively amplify a transient generated responsive to preliminary illumination of the lamp to provide an illumination-received pulse to allow continuous illumination of

the lamp; the non-operability of the lamp being detected responsive to non-occurrence of the transient, to prevent continuous illumination of the lamp; said circuit including a source of electric potential; a potential transformer having a primary winding connected in series between said source and said illuminating lamp, and having a secondary winding; said primary winding, responsive to application of an electric potential



to said lamp, having a potential impressed thereacross and inducing a transient in said secondary winding generating a back E.M.F. in said secondary winding; a transistorized amplifier connected to said secondary winding to amplify said back E.M.F.; and a monostable multivibrator having an input connected to said amplifier and effective, responsive to the amplified back E.M.F. to effect generation of the illumination-received pulse at an output thereof.

4,217,577

CHARACTER GRAPHICS COLOR DISPLAY SYSTEM

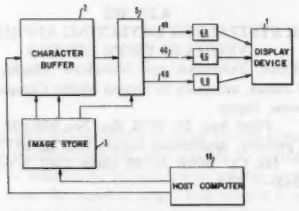
David Roe, Romsey, and Brian R. Sowter, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,334

Claims priority, application United Kingdom, Dec. 9, 1977, 51441/77

Int. Cl.² G06K *15/20*

U.S. Cl. 340—703 **4 Claims**



1. A color character graphic display system, including a display device by means of which a colored image consisting of image cells is displayed, character buffer means arranged in operation to store a set of different characters, each consisting of more than one character video cell, image buffer means arranged in operation to store information defining the image to be displayed, a plurality of color registers each arranged in operation to store video information relating to a different primary color, and control means operative in response to information read from the image buffer means to generate the video information for an image cell by copying from the character buffer the character video cells of which a selected character consists simultaneously and selectively to the color registers.

4,217,578

FLUORESCENT INDICATOR TUBE AND RELATED CIRCUIT

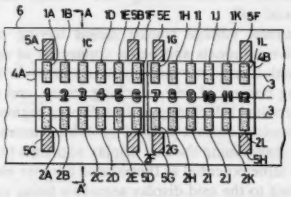
Mamoru Inami, and Yoshiaki Tanaka, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 23, 1977, Ser. No. 863,956

Claims priority, application Japan, Dec. 29, 1976, 51/160669; Dec. 29, 1976, 51/160670

Int. Cl.² H01J *17/48*

U.S. Cl. 340—754 **9 Claims**



1. A level indicator for indicating the level of multi-channel analog signals, comprising within an evacuated envelope:

first and second parallel rows of successively arranged anode electrodes each being coated with a layer of fluorescent material therein for emission of light in response to an impingement of electrons thereto when each anode electrode of said first row is energized in response to one of said multi-channel signals exceeding a corresponding one of graduated reference potentials and when each anode electrode of said second row is energized in response to the other of said multi-channel signals exceeding a corresponding one of said graduated reference potentials;

a cathode electrode for emitting electrons toward said anode electrodes; and

a grid electrode mounted between said cathode and anode electrodes covering said parallel rows of said anode electrodes for controlling the amount of electrons passing therethrough,

first and second variable length bar displays being generated by said first and second parallel rows of anode electrodes independently in response, respectively, to first and second signals.

4,217,579

METHOD OF DRIVING ELECTROCHROMIC DISPLAY MEANS AND ELECTROCHROMIC DISPLAY MEANS THEREFOR

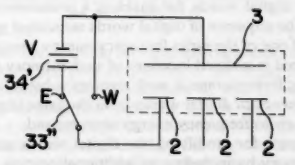
Hiroshi Hamada, Tenri; Hiroshi Nakauchi, Nara; Yasuhiko Inami, Tenri, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1977, Ser. No. 830,209

Claims priority, application Japan, Sep. 3, 1976, 51/106520

Int. Cl.² G06F *3/14*; G09F *9/32*

U.S. Cl. 340—763 **24 Claims**



1. An electrochromic display means comprising an electrochromic display cell having a counter electrode and display electrodes divided into a plurality of display segments, said

counter and display electrodes comprising an electrochromic substance of a type having a known coloration in a discharged condition;

electrolyte means contained within said electrochromic display means;

said electrolyte means having opacity for visually concealing said counter electrode from said display electrodes; and

driving circuit means comprising a constant voltage source means for driving said electrochromic display cell, and switching means having writing and erasing contacts for selectively interconnecting said voltage source means with said cell;

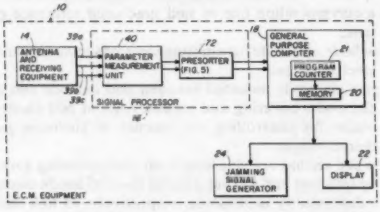
said constant voltage source means having positive and negative terminals and being connected at said negative terminal thereof to said counter electrode and to said writing contact of said switching means, and at said positive terminal selectively to said display segments through said erasing contact of said switching means for selectively maintaining the said display segments being colored at the same potential as that of said counter electrode and applying to the said display segments being erased a predetermined positive voltage from said constant voltage source with respect to said counter electrode.

4,217,580

ELECTRONIC COUNTERMEASURE SYSTEM

Oscar Lowenschuss, Goleta, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 22, 1976, Ser. No. 707,915
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—5 DP **8 Claims**



1. In a radio frequency receiver system adapted to receive a sequence of signals from a plurality of radio frequency energy sources and convert such signals into a corresponding sequence of digital words, each one of such words having portions representing different characteristics of such corresponding source, a selected one of the portions representing a characteristic of such source which provides an identification of such source, and including a digital computer having a memory adapted to store in locations thereof digital words coupled thereto through an improved signal processing apparatus, such signal processing apparatus comprising:

(a) means, responsive to the selected one of the portions of the digital words, for enabling a predetermined plurality of the sequence of digital words associated with an identified one of the radio frequency energy sources to become stored in selected locations of such memory and for inhibiting from storage in such memory subsequent ones of the sequence of digital words from the same identified one of the radio frequency energy sources; and,

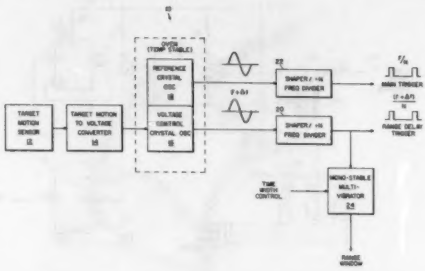
(b) means for modifying the digital words passed to such memory by including an additional portion to each such digital word passed to the memory, such additional portion providing an indication of the location in such memory of a previously stored digital word associated with the same identified one of the radio frequency energy sources.

4,217,581

HIGH RANGE RESOLUTION RADAR RATE AIDED RANGE TRACKER

Michael J. Prickett, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 22, 1978, Ser. No. 944,667
Int. Cl.[3] G01S *13/70*
U.S. Cl. 343—7.3 **8 Claims**



1. A rate aided range tracker having a range delay trigger for a high resolution radar having a main trigger comprising:

first means for sensing target motion and for converting detected target motion to a commensurate voltage output;

a reference oscillator for outputting a reference frequency signal;

a voltage controlled oscillator having its input connected to said first means for outputting a voltage controlled signal;

second means connected to said reference oscillator for outputting a pulse train that is the main trigger signal of said radar and for input to said main trigger of said high range resolution radar;

third means connected to said voltage controlled oscillator for outputting a trigger pulse train variably delayed or advanced from said second means pulse train for input to said range delay trigger; and

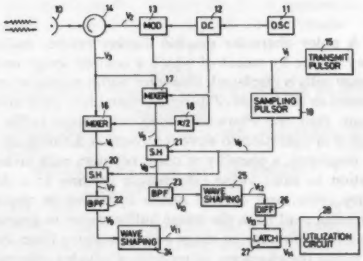
a monostable multivibrator connected to the output of said third means.

4,217,582

RADAR SYSTEM FOR DETECTING APPROACHING VEHICLES FROM BEHIND

Hiroshi Endō, Yokosuka, and Masahiro Adachi, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 23, 1978, Ser. No. 935,908
Claims priority, application Japan, Sep. 12, 1977, 52-108776
Int. Cl.[2] B60R *21/00*; G01S *7/42, 9/44*
U.S. Cl. 343—7 VM **4 Claims**



1. An automotive vehicle having a door arranged to open in

the path of an adjacent lane by manual operation of a lever attached thereto, comprising:

a Doppler radar device including an antenna, means for transmitting a beam of electromagnetic radiation from said antenna toward the rear of said vehicle so that Doppler echo signals are returned from vehicles in said adjacent lane and receiving said returned echo signals, and means responsive to said returned echo signals for detecting when said vehicle in said adjacent lane is approaching said radar antenna and generating a warning signal;

sensing means for detecting when said lever is manually operated to generate a second signal;

a coincidence gate responsive to the simultaneous presence of said warning signal and said second signal to generate a third signal; and

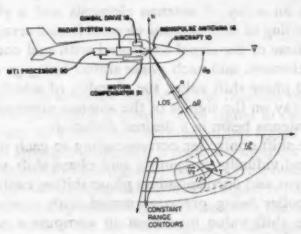
audible means responsive to said third signal for generating an audible warning signal.

4,217,583

MOVING TARGET INDICATOR (MTI) RADAR SYSTEMS

Edwin R. Hiller, Weston, Mass.; Philip D. Kaplan, Nashua, N.H.; Joseph M. Nicosia, Jr., Acton, and Henry D. Zuerndorfer, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 30, 1975, Ser. No. 582,965
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 **13 Claims**



1. In a moving target indicator radar system adapted to be carried on a moving platform, such system including a monopulse receiver adapted to process radar returns comprised of the returns from the moving target and returns from clutter, such clutter returns being within a band of clutter frequencies, the improvement comprising:

(a) means for providing a reference signal having a predetermined power level; and

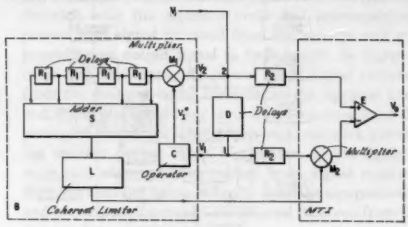
(b) means, responsive to the returns from the moving target and the returns from the clutter, for distinguishing between the clutter returns and the moving target returns to indicate the presence of a moving target having a Doppler frequency within the band of clutter frequencies including means for determing the difference between the power level of the radar returns passing through a difference channel of such receiver at a selected Doppler frequency within the band of clutter frequencies and the predetermined power level of the reference signal, such difference being indicative of a moving target when the former power level is different from the latter power level.

4,217,584

SYSTEM FOR THE SUPPRESSION BY MATCHING TECHNIQUES OF UNWANTED ECHOES IN IMPULSE COHERENT RADARS

Paolo Lombardi, Viale del Ciclismo, 10, Rome, Italy (00144), and Gaspare Galati, via Pisino, 151, F2/C/15, Rome, Italy (00177)

Continuation of Ser. No. 806,865, Jun. 15, 1977, abandoned. This application Jul. 21, 1978, Ser. No. 926,751
Claims priority, application Italy, Jun. 15, 1976, 49953 A/76
Int. Cl.[2] G01S 9/42, 9/02
U.S. Cl. 343—7.7 **4 Claims**



1. A method for suppressing undesirable echoes in a pulse coherent radar, wherein the suppression of the undesirable echoes is carried out in an adaptive or matching manner, making use of a variable weight which is determined by processing the complex video signals relating to two successive scans, said method comprising the steps of:

converting one scan to its conjugate complex;

multiplying the conjugate of said one scan times the complex of the other scan;

subdividing each range scan into plural range resolution cells;

introducing an even number of successive delays, all of a size equal to the width of a resolution cell in distance;

summing the contributions of signals delayed in each resolution cell with the exception of a signal to which there has been applied the number of said successive delays;

normalizing to the value 1 the total signal obtained by summing the contributions of signal delayed in each of said resolution cells, said normalized signal comprising a weighting signal;

multiplying said weighting signal times one scan and applying the resultant signal to one input of a canceller;

applying the other scan with a weight of 1 to another input of the canceller;

whereby the resultant canceller output signal is delayed by time equal to the width of said resolution cell multiplied by one-half of said even number of delays.

4,217,585

DUAL FREQUENCY DOPPLER RADAR

William Fishbein, Elberon, and Otto E. Rittenbach, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 9, 1978, Ser. No. 959,388
Int. Cl.[2] G01S 9/42
U.S. Cl. 343—7.7 **21 Claims**

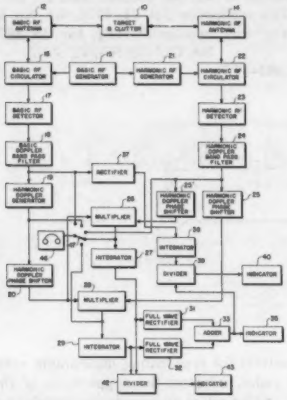
1. A doppler radar system for determining characteristics of a target based on the peak amplitudes of the target returns of two harmonically related frequencies f_1 and f_2 comprising means for generating and radiating into a region of space occupied by a moving target and clutter a first signal of frequency f_1 substantially unaffected by moving clutter,

means for generating and radiating into said region of sapce a second signal of frequency f_2 which is an integral number N times higher in frequency than said first frequency,

first and second receiving channels including means for selectively receiving respective first and second doppler

shifted signals of frequency $f_1 \pm D$ and $f_2 \pm ND$ after reflection of said first and second signals from a target and from clutter and for mixing said doppler shifted signals with said radiated signals to produce first and second doppler frequency signals of frequency D and ND,

frequency multiplying means disposed in first receiving channel for multiplying the frequency of said first doppler



frequency signal by a factor N to obtain a multiplied doppler frequency signal of frequency ND, and

at least one correlator means responding to said doppler frequency signals of frequency ND in both of said receiving channels comprising a frequency multiplier and an integrator coupled to said multiplier for providing an integrated output independent of radar returns from said moving clutter.

4,217,586

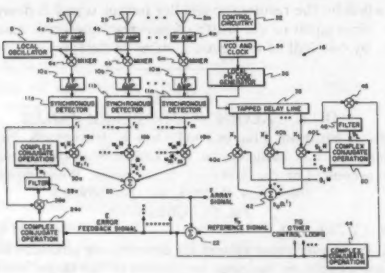
CHANNEL ESTIMATING REFERENCE SIGNAL PROCESSOR FOR COMMUNICATION SYSTEM ADAPTIVE ANTENNAS

August L. McGuffin, Clinton, N.Y., assignor to General Electric Company, Utica, N.Y.

Continuation-in-part of Ser. No. 796,952, May 16, 1977, abandoned. This application Aug. 11, 1978, Ser. No. 932,897

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—100 LE **6 Claims**



1. An antenna array adaptive signal processor for improving the signal-to-noise ratio of a received signal containing a direct component and multipath components in an unknown electromagnetic environment comprising:

signal conducting means for carrying a plurality of signals from antenna elements along a plurality of preselected paths,

filter means connected between said array signal and each of said signal conducting means to minimize the mean square error of said array signal as compared with a reference signal, whereby said array signal is formed in a selected look direction, and

adaptive channel estimating means for generating said reference signal so that said reference signal includes the direct component as well as the multipath components of the received signal.

4,217,587

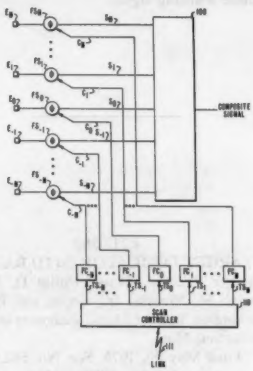
ANTENNA BEAM STEERING CONTROLLER

Omar J. Jacomini, Severna Park, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 14, 1978, Ser. No. 933,331

Int. Cl.[2] H01Q *3/26*

U.S. Cl. 343—100 SA **9 Claims**



1. In an electronically scanned phased array antenna system including an array of antenna elements and a phase shifter corresponding to each antenna element in said array for adjusting the phase of the signal associated with said corresponding antenna element, said each phase shifter being governed by a computed phase shift value, the plurality of which effecting a phased array on the signals of the antenna elements for pointing the antenna beam in a desired direction;

a phase shift controller corresponding to each phase shifter for individually computing said phase shift value which governs said corresponding phase shifter, each phase shift controller being preprogrammed with a predetermined phase shift value increment to compute a sequence of phase shift values in accordance with a predetermined time pattern, thereby governing the scan of the antenna beam in a corresponding sequence of desired directions.

4,217,588

OBJECT MONITORING METHOD AND APPARATUS

Charles C. Freeny, Jr., Fort Worth, Tex., assignor to Information Identification Company, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 568,671, Apr. 16, 1975, Pat. No. 4,112,421. This application Mar. 16, 1978, Ser. No. 887,192

Int. Cl.[2] G01S *3/02*

U.S. Cl. 343—112 D **31 Claims**

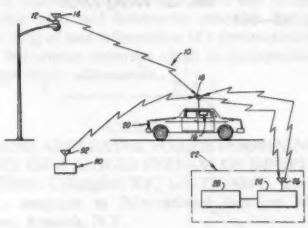
1. Apparatus for use in monitoring objects within a predetermined monitored area comprising:

a signpost unit positioned within the monitored area and having a predetermined signpost code encoded therein uniquely identifying the signpost unit and providing an output signal encoded with the signpost code, the signpost unit output signal establishing a near field region extending a distance generally from the signpost unit and encompassing a predetermined coverage region at least large enough to encompass a monitored object and the signpost

unit output signal establishing a far-field region extending a distance generally from the signpost unit and encompassing a predetermined coverage region, the far-field region extending a distance from the signpost unit greater than the distance of the near-field region from the signpost unit and the strength of the signpost unit output signal within the near-field region being greater than the strength of the signpost unit output signal within the far-field region; and

means in the monitored object receiving the signpost unit output signal having a portion detecting the strength of the received signpost unit output signal for providing one output signal in response to a received signpost unit output signal having a signal strength less than a predetermined signal strength level thereby indicating the location of the monitored object within the far-field region of the signpost unit identified via the signpost code encoded in the received signpost unit output signal, and providing another output signal in response to a received signpost unit output signal having a signal strength greater than the predetermined signal strength level thereby indicating the location of the monitored object within the near-field region of the signpost unit identified via the signpost code encoded in the received signpost unit output signal, the means in the monitored object defined further as comprising:

a receiver for receiving the signpost unit output signal and providing a receiver output signal encoded with the signpost code encoded in the received signpost unit output signal;



a power level detector receiving the receiver output signal and providing a power level signal in one state in response to a received receiver output signal having a signal strength indicating a received signpost unit output signal having a signal strength corresponding to the strength of the signpost unit output signal in the far-field region thereby indicating the location of the monitored object within the far-field region of the signpost unit and providing a power level signal in another state in response to a received receiver output signal having a signal strength indicating a received signpost unit output signal having a signal strength corresponding to the strength of the signpost unit output signal within the near-field region thereby indicating the location of the monitored object within the near-field region;

a decoder receiving the receiver output signal and providing the signpost code encoded in the received receiver output signal via a decoder output signal, the decoder receiving the power level signal provided via the power level detector and providing the received power level signal along with the signpost code via the decoder output signal, the state of the power level signal indicating the location of the monitored object within the near-field region of the signpost unit identified via the signpost code encoded in the receiver output signal in one state of the power level signal and indicating the location of the monitored object within the far-field region of the signpost unit identified via the signpost code encoded in the receiver output in one other state of the power level signal;

a storage unit receiving the signpost codes and accompanying power level signals from the decoder and storing the received signpost code and accompanying power level signal in one condition of the storage unit, the storage unit providing the signpost code and accompanying power level signal therein in one other condition of the storage unit in response to receiving a signal;

a comparison logic network receiving the signpost code and accompanying power level signal provided via the decoder and the signpost code and accompanying power level signal provided via the storage unit, the comparison logic network comparing the signpost code and accompanying power level signal received from the decoder with the signpost code and accompanying power level signal received from the storage unit and providing an output signal in response to the signpost code and accompanying power level signal received from the decoder being identical to the signpost code and accompanying power level signal received from the storage unit, and the comparison logic network providing another output signal in response to the signpost code and accompanying power level signal received from the decoder being different from the signpost code and accompanying power level signal received from the storage unit;

a location encoder receiving the signpost code and accompanying power level signal from the storage unit; and

means in the monitored object providing the signal for conditioning the storage unit to provide the signpost code and accompanying power level signal for storing in the location encoder in response to a signal from the comparison logic network indicating a difference between the signpost code and accompanying power level signal received from the decoder and the signpost code and accompanying power level signal received from the storage unit.

4,217,589

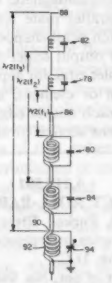
GROUND AND/OR FEEDLINE INDEPENDENT RESONANT FEED DEVICE FOR COUPLING ANTENNAS AND THE LIKE

Alfred F. Stahler, 5521 Big Oak Dr., San Jose, Calif. 95129

Continuation-in-part of Ser. No. 648,377, Jan. 12, 1976, abandoned. This application Jul. 26, 1978, Ser. No. 928,151

Int. Cl.[2] **H01Q** *1/50*

U.S. Cl. 343—722 **2 Claims**



1. A feed device for coupling feed line means to a narrow band antenna of specific resonant frequency and well defined electrical current and voltage node points, wherein the antenna currents at the electrical end points of the antenna are zero, wherein the antenna and the feed line are formed of coaxial cable, comprising the combination of;

resonant circuit means formed from the antenna feed line and having an infinite impedance at a well defined current node point and resonant at a specific resonant frequency

identical with the same specific antenna resonant frequency before and after being coupled to the antenna;

wherein the resonant circuit means includes inductor means formed from an extension of the coaxial cable, and capacitor means coupled in shunt across the inductor means and directly to the shield of the coaxial cable, with the common junction therebetween nearest the antenna defining a current node point of infinite impedance which is coupled to the current node point of the antenna;

a feed line connection coupled to the resonant circuit means and having substantially zero antenna current thereon due to the common coupling of the respective current node points, to thus preclude altering the electrical and radiation characteristics of the antenna by the presence of the feed line; and

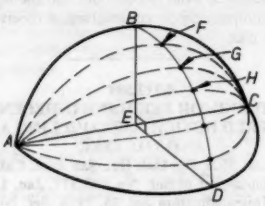
wherein the antenna further includes matching pairs of traps selectively disposed in electrical series along the length thereof to provide a multiple-band antenna array which is resonant at selected multiple frequencies, said resonant circuit means being formed at the feed end of the antenna and disposed to resonate at the lowest frequency of the selected multiple frequencies to isolate the antenna from the feed line.

4,217,590

ELECTROMAGNETIC LENS FOR RF AERIALS

John P. Wild, Strathfield, and Geoffrey T. Poulton, Telopea, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Sep. 25, 1978, Ser. No. 945,289
Claims priority, application Australia, Sep. 23, 1977, PD1800
Int. Cl.[2] H01Q *19/06, 15/24*
U.S. Cl. 343—754 **17 Claims**



1. A parallel plate electromagnetic lens comprising a plurality of petal-shaped parallel plate lens sections or elements connected in series, each petal-shaped section having a signal inlet edge and a signal output edge, signal input means being provided along each inlet edge for supplying RF signals to the associated lens section or element, and signal outlet means being provided along each output edge for conducting signals out of the associated lens section or element.

4,217,591

HIGH FREQUENCY ROLL-BAR LOOP ANTENNA

Watson P. Czerwinski, Forked River, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 944,043, Sep. 20, 1978, abandoned. This application Aug. 27, 1979, Ser. No. 69,958
Int. Cl.[3] H01Q *1/32, 7/00*
U.S. Cl. 343—713 **4 Claims**

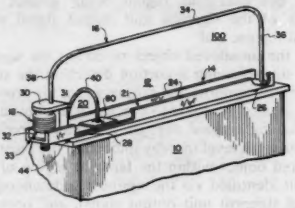
1. A loop antenna for operation on a moving vehicle comprising:

a metallic base mounted longitudinally on top of said vehicle;

a vertically mounted elongated, metallic loop element having one end affixed to said metallic base;

a variable capacitor in series with the other end of said metallic loop element and said metallic base and in conjunction with said metallic base and said elongated metallic loop element forming a closed transmitting loop;

a coupling loop of variable area, coplanar with and at no point exterior to, said closed transmitting loop and inductively coupled thereto; and



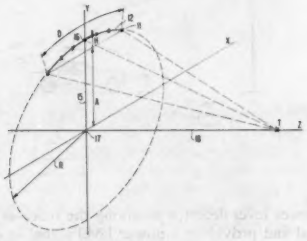
an input terminal electrically connected to said coupling loop for feeding a signal into or removing a signal from said coupling loop.

4,217,592

QUASI-LINEAR ANTENNA ARRAY

Carl E. Schwab, Huntington Station, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Jan. 15, 1979, Ser. No. 3,690
Int. Cl.[2] H01Q *21/20*
U.S. Cl. 343—844 **9 Claims**



1. An antenna array mounted above a target plane arranged to be focused at every point on a line extending in said plane, perpendicular to said array and through the vertical projection of a center of said array, comprising:

a support having a length at least D,

a plurality of antenna elements mounted on said support with each said element having a phase center along an axis of said support, the distance between extreme antenna elements on said support equal to or less than D, and

said support describing a circular segment in a vertical plane of radius equal to the distance between extreme ends of said support, and said vertical projection of said array center.

4,217,593

WATER DEPTH-LORAN POSITION RECORDER

Ray B. Kauffman, 3876 N. Landing Rd., Virginia Beach, Va. 23456

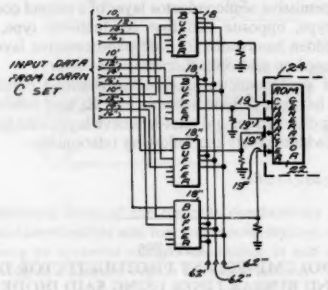
Filed Mar. 12, 1979, Ser. No. 19,751
Int. Cl.[2] G01D *9/28*
U.S. Cl. 346—62 **23 Claims**

1. Apparatus, for use with a chart recording fathometer, for receiving information of a predetermined type and for recording said information on said chart with water depth information from said fathometer, said apparatus comprising:

first means for receiving said predetermined type information;

means in operative relationship with said receiving means for storing said predetermined type information; and

means in operative relationship with said storing means and with said fathometer for enabling the recording of said information of a predetermined type on said chart with said water depth information;



said enabling means including second receiving means connected in electrical circuit relationship for receiving transducer transmit pulses from said fathometer, and first electrical circuit means connected in electrical circuit relationship with said second receiving means and in operative relationship with said fathometer recorder for enabling the recording of said information of a predetermined type on said fathometer recorder chart in juxtaposition with said water depth information.

4,217,594

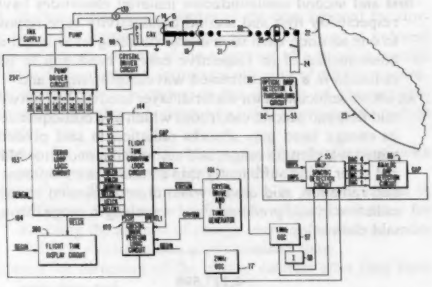
METHOD AND APPARATUS FOR DETERMINING THE VELOCITY OF A LIQUID STREAM OF DROPLETS

Kermit A. Meece, Lexington, Ky., and Thomas S. Taylor, Atlanta, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1977, Ser. No. 843,081

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **21 Claims**



1. An apparatus for determining the velocity of a pressurized liquid stream of droplets including:

means to supply a pressurized liquid stream;

means to cause breakup of the stream into droplets spaced substantially uniform distances;

means acting on the stream to cause a gap greater than the substantially uniform distance between adjacent droplets to be present in the stream of droplets at a selected distance from the point at which said acting means acts on the stream;

sensing means to sense the presence of the gap in the stream of droplets at the selected distance from the point at which said acting means acts on the stream;

and means to determine the velocity of the stream in accordance with the time that it takes for said sensing means to sense the gap after said acting means has acted on the stream to produce the gap.

4,217,595

CHARGING PHASE CONTROL DEVICE FOR INK JET RECORDING DEVICE

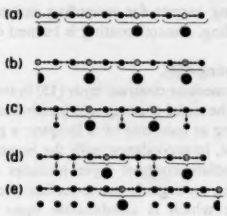
Masanori Horike, Yokohama; Koichiro Jinnai, Kawasaki; Kyuhachiro Iwasaki, Fujisawa, and Yutaka Kodama, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 25, 1979, Ser. No. 33,125

Claims priority, application Japan, Apr. 27, 1978, 53/50424; May 12, 1978, 53/56224; May 12, 1978, 53/56225; May 15, 1978, 53/57424

Int. Cl.[2] G01D *15/18*

U.S. Cl. 346—75 **7 Claims**



1. A charge phase control device for use in an ink jet printing or recording device comprising

an exciting signal generator for generating the exciting signal so as to cause the emission of ink droplets,

a first charging signal generator for generating the charging signal so as to charge the ink droplets positively or negatively in the recording mode,

a second charging signal generator for generating the charging signal so as to charge a second set of ink droplets negatively or positively in the phase detection mode,

a charging electrode responsive to said charging signal from said first or second charging signal generator for positively or negatively charging the ink droplets,

an ink droplet detection means disposed between said charging electrode and a gutter for detecting the ink droplets flying from said charging electrode to said gutter,

a frequency discriminator or a frequency counter for integrating or counting the ink droplet detection pulses from said ink droplet detection means so as to discriminate or count the frequency of said pulses and generating a flag signal when the discriminated or counted frequency is less than a predetermined value, and

a phase setting circuit responsive to said flag signal from said frequency discriminator or said frequency counter for locking the phase of said exciting signal to the phase of the ink droplet charging, whereby in response to the phase detection mode signal, said second charging signal generator,

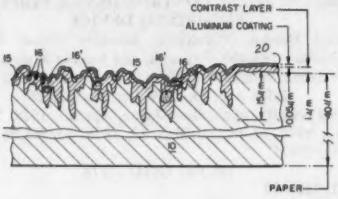
said frequency discriminator or said frequency counter and said phase setting circuit are energized so that said charging electrode may receive the negative or positive pulse voltages of the same frequency with that of said exciting signal, thereby charging the ink droplets in such a way that more than two successive ink droplets may be negatively or positively charged and one or more succeeding ink droplets may be uncharged or positively or negatively charged.

4,217,596

RECORDING CARRIER FOR ELECTRICAL DISCHARGE RECORDING APPARATUS

Werner Jung, Waiblingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1978, Ser. No. 954,637
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748161
Int. Cl.[2] G01D *15/24*
U.S. Cl. 346—135.1 12 Claims



1. Recording carrier for recording instruments in which, during recording, a metal coating is burned off, having a substrate (10);

a metal coating (20);

and an intermediate contrast layer (15) between the substrate (10) and the metal coating, said intermediate contrast layer comprising at least one of: a lacquer; a printing ink,

and wherein, in accordance with the invention,

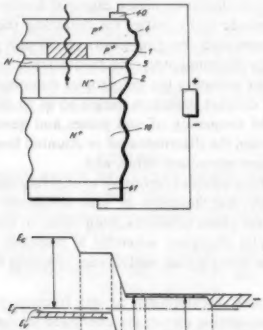
the intermediate contrast layer includes an additive (16) comprising an organic matte-surface producing granular substance which is combustible upon burning-off the metal coating during recording.

4,217,597

DIODE WHICH TRANSMITS AND RECEIVES LIGHT-RAYS OF THE SAME PREDETERMINED WAVELENGTH AND OPTICAL TELECOMMUNICATIONS DEVICE USING SUCH A DIODE

Pierre Hirtz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 2, 1978, Ser. No. 957,196
Claims priority, application France, Nov. 7, 1977, 77 33354
Int. Cl.[2] H01L *31/12, 33/00, 29/161*
U.S. Cl. 357—19 5 Claims



1. Diode capable of emitting and receiving light-rays of a predetermined wavelength, comprising:

a semiconductor substrate of a first conductivity type, having a surface;

a photoreceptive semiconductor layer of said first conductivity type, having a forbidden bandwidth E_1, said photoreceptive layer being disposed on said surface;

an optical confinement semiconductor layer of said first conductivity type, having a forbidden bandwidth E_3, said optical confinement layer being disposed on said photoreceptive layer;

a photoemissive semiconductor layer of a second conductivity type, opposite said first conductivity type, having forbidden bandwidth E_2, said photoemissive layer being disposed on said optical confinement layer;

another semiconductor layer of said second conductivity type having a forbidden bandwidth E_4, said another layer being disposed on said photoemissive layer, said forbidden bandwidths satisfy the following relationship:

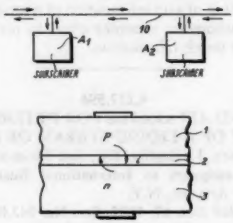
$$E_1 < E_2 < E_3 \leq E_4.$$

4,217,598

ELECTROLUMINESCENT PHOTODETECTOR DIODE AND BUSBAR LINES USING SAID DIODE

Luigi d'Auria; Baudoin de Crenoux, and Andre Jacques, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 11, 1978, Ser. No. 895,502
Claims priority, application France, Apr. 15, 1977, 77 11425
Int. Cl.[2] H01U *31/12;* H01L *29/161*
U.S. Cl. 357—19 8 Claims



1. An electroluminescent and photodiode comprising:

first and second semiconductor material electrodes having respectively first and second conductivity type opposite to one another, each such electrode being transparent as a consequence of its respective energy band gap to light radiation in a predetermined wavelength range; and

an active semiconductor material layer sandwiched between said first and second electrodes which as a consequence of its energy band gap, absorbs radiation in said predetermined wavelength range, said active semiconductor Material layer being sufficiently thin so that it is transparent to said radiation, said diode, when directly biassed emitting radiation in said predetermined wavelength range through said electrodes.

4,217,599

NARROW CHANNEL MOS DEVICES AND METHOD OF MANUFACTURING

Shuichi Sato, Beaverton; Tadanori Yamaguchi, Portland, both of Oreg., and Arthur D. Ritchie, San Diego, Calif., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 21, 1977, Ser. No. 862,715
Int. Cl.[2] H01L *29/78, 27/02, 29/06*
U.S. Cl. 357—23 10 Claims

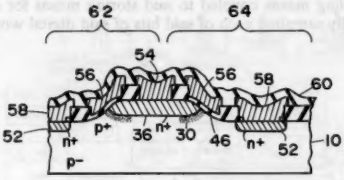
1. A field effect transistor comprising:

a body of semiconductor material having a nonplanar surface that includes adjacent areas of relatively higher and lower elevation joined by a slope,

a first region of one conductivity type in said body underlying said higher elevation area,

a second region of the same conductivity type in said body underlying said lower elevation area,

one of said first and second regions serving as a source region and the other as a drain for said transistor, and



an implanted layer of the opposite conductivity type disposed intermediate said first and second regions, said layer having an upturned margin terminating at said slope and serving as a channel region for said transistor.

4,217,600

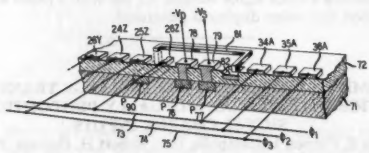
CHARGE TRANSFER LOGIC APPARATUS

George E. Smith, Murray Hill, and Michael F. Tompsett, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 82,959, Oct. 22, 1970, abandoned. This application Feb. 11, 1971, Ser. No. 114,625

Int. Cl.[2] H01L *27/04*; G11C *19/28*

U.S. Cl. 357—24 **19 Claims**



1. In charge transfer apparatus of the type adapted for storage and serial transfer of charge carriers localized in induced potential energy minima along a portion of a suitable storage medium by sequentially applying a plurality of differing potentials to successive portions of the surface of the medium through a plurality of electrodes, the improvement which includes

means for providing bit regeneration in combination with said storage and serial transfer comprising:

electrically floating means disposed in said apparatus in sufficient proximity to a first one of said electrodes for detecting the amount of charge carriers transferred under said first electrode at a predetermined time;

means for disposing of the charge carriers after they have been detected;

controllable means for injecting a controlled number of charge carriers at another location along said surface;

gating means passively connected to the electrically floating means and disposed between the injecting means and a second one of the plurality of electrodes for causing the injecting means to inject charge carriers and for controlling the transfer of the newlyinjected carriers away from the injection means in response to the detection at the predetermined location; and

means coupling the first and second electrodes together sufficiently that the same phase is applied to both in response to the applied potentials.

4,217,601

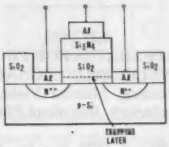
NON-VOLATILE MEMORY DEVICES FABRICATED FROM GRADED OR STEPPED ENERGY BAND GAP INSULATOR MIM OR MIS STRUCTURE

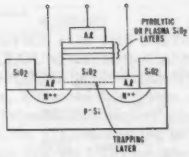
Roger F. DeKeersmaecker, Cronton-on-Hudson; Donelli J. DiMaria, Mt. Kisco, and Donald R. Young, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 15, 1979, Ser. No. 12,279

Int. Cl.[2] H01L *29/34*

U.S. Cl. 357—54 **17 Claims**





1. A metal-insulator-metal or metal-insulator-semiconductor structure, wherein the band gap of the insulator layer at its first interface only is reduced to provide an injection region where holes or electrons depending on voltage bias, can be injected into the insulator under low to moderate electrical field conditions from the contact at this interface while, simultaneously, electron or hole injection from said insulator's second interface is blocked due to the large insulator band gap near said second interface, the improvement being a charge trapping layer embedded in said insulator near its second interface for capturing and storing injected electrons or holes with high efficiency.

4,217,602

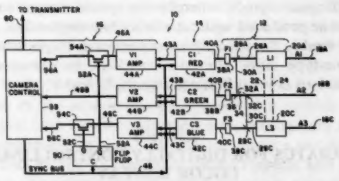
METHOD AND APPARATUS FOR GENERATING AND PROCESSING TELEVISION SIGNALS FOR VIEWING IN THREE DIMENSIONS

Wayne W. Thomas, and Walter C. Thomas, both of Tahlequah, Okla., assignors to Lady Bea Enterprises, Inc., Tahlequah, Okla.

Filed Feb. 12, 1979, Ser. No. 11,399

Int. Cl.[2] H04N *9/60*

U.S. Cl. 358—3 **13 Claims**



1. Apparatus for generating and processing television signals of a visual scene for viewing in three-dimensions, comprising;

(a) first, second, and third video camera tubes, each with their corresponding optical axes in a horizontal plane and nominally parallel to each other; each camera tube sensitive to light of a selected primary color, respectively;

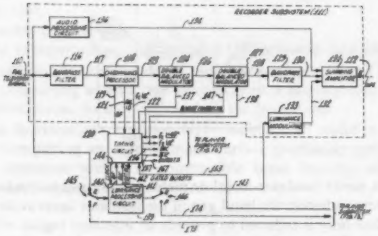
(b) means to transmit said visual scene light, of a first primary color to said first camera tube, light of a second primary color to said second camera tube, and light of a third primary color to said third camera tube;
(c) means to drive the scanning systems in said three camera tubes responsive to a synchronizing signal in an interlaced first and second raster;
(d) means to mute the output signal of said first camera tube on said first raster; and
(e) means to mute the output signal of said third camera tube on said second raster.

4,217,603

METHOD AND APPARATUS FOR PROCESSING COLOR TELEVISION SIGNALS

Bernhard A. Hjortzberg, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 958,148
Int. Cl.[2] H04N 9/00
U.S. Cl. 358—12 **98 Claims**



1. A method of processing a quadrature chrominance subcarrier of a color television signal, said subcarrier having a frequency f_c and having one component amplitude modulated by a first color difference signal, and a quadrature component amplitude modulated by a second color difference signal, said method comprising:

converting the quadrature chrominance subcarrier to a special output chrominance subcarrier having a frequency compatible with a conventional Phase Alternation Line-type color television receiver and having a fixed phase angle X selected to be any angle between 0° and 360°, other than 0°, 90°, 180° or 270°, wherein the special output subcarrier is amplitude modulated on alternate horizontal scan lines by K[U sin (X)+V cos (X)] and K[U sin (X)31 V cos (X)], wherein K is +1 when the angle X is selected to be between 0° and 90° or 180° and 270°, and −1 when the angle X is selected to be between 90° and 180° or 270° and 360°, and wherein U and V are both standard color difference signals derived from said first and second color difference signals, whereby the special output subcarrier can be produced without a delay line mechanism, and can be readily decoded by a conventional Phase Alternation Line-type color television receiver, to derive the two standard color difference signals, U and V.

4,217,604

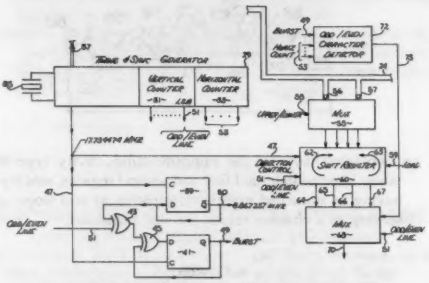
APPARATUS FOR DIGITALLY CONTROLLING PAL COLOR DISPLAY

Stephen G. Wozniak, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 11, 1978, Ser. No. 941,032
Int. Cl.[2] H04N 9/38
U.S. Cl. 358—16 **12 Claims**

1. In an apparatus for use with a phase alternation line video display adapted to receive color signals having a color subcarrier reference signal of frequency N, an improved color signal generation means comprising:

means for generating at least one digital word which corresponds to a predetermined color, said digital word comprising a plurality of bits;
storing means for storing said digital word;
circuit means for providing an odd/even signal representative of odd and even lines on said display;
sampling means coupled to said storing means for sequentially sampling each of said bits of said digital words at a



predetermined sampling rate in a first sequence and a second sequence opposite to said first sequence, said first and second sequences being selected according to said odd-even signal and said predetermined sampling rate being selected such that a color signal is developed at an output of said sampling means which corresponds to said predetermined color and which has a frequency component at said frequency N;
whereby a color signal suitable for use with a phase alternation line video display is generated.

4,217,605

COMB FILTER EMPLOYING A CHARGE TRANSFER DEVICE WITH PLURAL MUTUALLY PROPORTIONED SIGNAL CHARGE INPUTS

James E. Carnes, Indianapolis, Ind.; Robert H. Dawson, Princeton, and Walter F. Kosonocky, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 2, 1978, Ser. No. 930,379
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—31 **13 Claims**

1. Comb filter apparatus for processing a video signal containing image-representative luminance and chrominance components disposed within a frequency spectrum of said video signal in frequency interleaved relation, comprising:

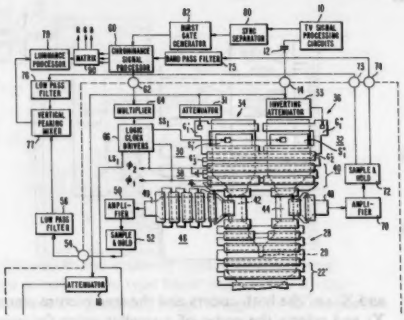
a charge transfer device arrangement including
first and second charge combining means;
means for providing first and second inputs for coupling signal charge representative of mutually complementary versions of said video signal to said first and second combining means, respectively, each of said first and second inputs having a predetermined geometry for determining its video signal voltage to charge amplitude conversion characteristic;
means for providing a third input responsive to said video signal and having a predetermined geometry for determining the video signal voltage to charge amplitude conversion characteristic of said third input, said geometry of said third input being related to said geometry of said first and second inputs such that the effective voltage to charge amplitude conversion characteristic of said third input is substantially equal to the aggregate of the voltage to charge amplitude conversion characteristics of said first and second inputs;
a charge transfer channel comprising a plurality of delay stages for receiving signal charge from said third input;

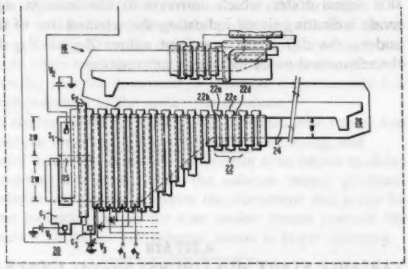
means for coupling a first delayed signal charge portion from said channel to said first combining means;

means for coupling a second delayed signal charge portion from said channel to said second combining means; and

wherein

each of said first and second coupled delayed signal charge portions is delayed relative to said charge coupled to the respective first and second combining means from said first and second inputs by an amount corresponding to a horizontal line scanning interval, said first and second delayed signal charge portions being relatively proportioned in a manner substantially identical to the relative proportioning of the voltage to charge amplitude conversion characteristics of said first and second inputs.





4,217,606

OPTICAL MONITORING FACILITY AND THE METHOD FOR USING IT

Kurt Nordmann, Engimattstrasse 20, Zürich, Switzerland

Filed Feb. 14, 1979, Ser. No. 12,177

Claims priority, application Switzerland, Feb. 17, 1978, 1772/78; Fed. Rep. of Germany, Nov. 21, 1978, 2850419

Int. Cl.[2] H04N *7/18*; G03B *17/02, 21/00*

U.S. Cl. 358—108 **17 Claims**

1. Apparatus for optical monitoring, comprising:

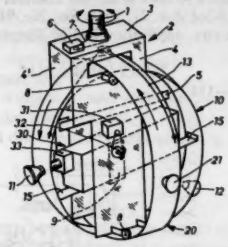
camera means;

camera lens means;

dummy lenses means;

control equipment means;

fixing axis means; the apparatus being rotatable around said fixing axis means, said camera means being optically connected with the camera lens means, said control equipment means regulating said camera and movement functions of the apparatus and said camera lens means and dummy lens means being movable relative to each other.



4,217,607

PROCESS AND DEVICE FOR THE INSTANTANEOUS DISPLAY OF A COUNTRYSIDE SCANNED BY A CAMERA OF THE SINGLE LINE SCANNING TYPE

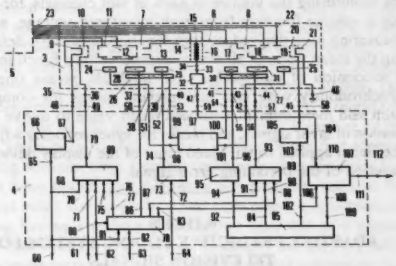
Jean-Pierre D. Cohen, Villiers-le-Bel, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Continuation of Ser. No. 571,228, Apr. 24, 1975, abandoned. This application Sep. 19, 1978, Ser. No. 943,867

Claims priority, application France, May 7, 1974, 74 15769

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—109 **4 Claims**

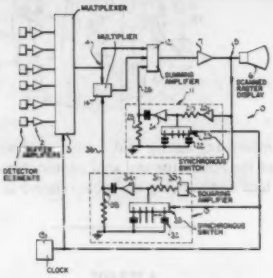


1. A method for real time displaying on a TV monitor of a scene scanned from an aircraft by a line scan apparatus, wherein a two-gun tube is incorporated as an image storage means between the line scan apparatus and the TV monitor, said tube having a target, a writing gun connected to the output of the line scan apparatus and providing a writing beam for scanning said target to establish a charge pattern on the target, and a reading gun providing a reading beam for reading said charge pattern, comprising scanning the target by the writing gun line by line at a frame rate dependent on the speed-to-altitude ratio of the aircraft during the effective periods of the video signal from the line scan apparatus, erasing lines already written and stored so as to define on the target a moving rectangular area having no charge deposited thereon, said rectangular area comprising at least two line spaces, scanning that area of said target having charges thereon by the reading gun in accordance with the scanning standard of the TV monitor in such manner that the first and last lines read out by the reading gun during a frame scan are constantly situated on respective opposed sides of said moving rectangular area, and feeding the TV monitor with the signal from the reading gun.

4,217,608
RADIATION SCANNING SYSTEM

Stuart MacGregor, and Peter J. Berry, both of Glasgow, Scotland, assignors to Barr & Stroud Limited, Glasgow, Scotland

Filed Jun. 27, 1978, Ser. No. 919,451
Claims priority, application United Kingdom, Jun. 29, 1977, 27129/77
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—113 5 Claims



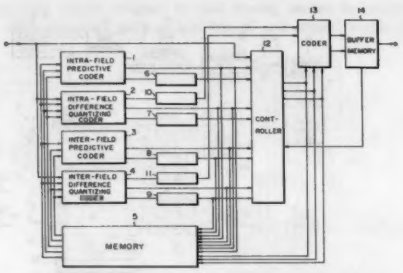
1. A radiation scanning system comprising a radiation detector having a plurality of detecting elements each of which forms the input of a d.c. coupled electrical-signal-handling channel, multiplexing means connected to each said channel and providing an output terminal, a scanned raster display device having a video input driven by a signal derived from the signal appearing at said output terminal, and means for compensating for variation in transfer characteristics of said detector elements, wherein said compensating means comprises means operating synchronously with said multiplexing means for monitoring the voltage in each of said channels, for deriving a voltage function from each monitored voltage, and for measuring each derived voltage function, means for determining the mean value of all said measured voltage functions over a succession of multiplexer time intervals, means operating synchronously with said multiplexing means for comparing each said measurement with said mean value to derive a succession of error signals, and means for synchronously adjusting the signal applied to the video input of the display device as a function of the pertaining error signal.

4,217,609
ADAPTIVE PREDICTIVE CODING SYSTEM FOR TELEVISION SIGNALS

Yoshinori Hatori, Yokohama, and Hideo Yamamoto, Sagamihara, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1979, Ser. No. 15,668
Claims priority, application Japan, Feb. 28, 1978, 53/21465
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—136 2 Claims

1. An adaptive predictive television signal coding system comprising: a memory having a capacity capable of storing an input television signal of at least one field and one picture element at all times; an intra-field difference quantizing coder which, when supplied with a value X_1 of the latest input picture element of the television signal, reads out from the memory a picture element value in the same field as the input signal to produce a predictive value X_{12} of the latest input picture element and quantizes a difference between the predictive value and the latest picture element value to produce a difference quantized value Z_{12} and provides a decoded value X_{12} of the latest picture element as $X_{12}=X_{12}+Z_{12}$; an inter-field difference quantizing coder which, then supplied with the value X_1 of the latest picture element, reads out from the memory picture element values in the same field as the input signal and a field immediately preceding it to produce a predictive value X_{14} of the latest input picture element and quantizes a difference between the predictive value and the latest picture element to produce a difference quantized value Z_{14} and provides a decoded value X_{14} of the latest picture element as $X_{14}=X_{14}+Z_{14}$; an adaptive predictive coding control part which compares differences between the decoded values X_{12}

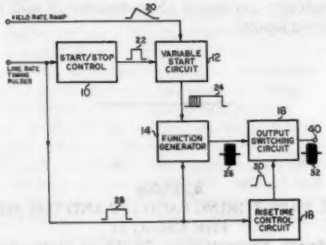


and X_{14} of the both coders and the true picture element value X_1 and selects the coder of a smaller error for using it as a coder for predicting the latest picture element; and a transmission signal coder which converts to transmission signals a mode indicating signal indicating the selected one of the two coders, the difference quantized values Z_{12} or Z_{14} derived therefrom and mode indicating information.

4,217,610
VARIABLE START MULTIBURST SIGNAL GENERATOR

David J. Jurgensen, Gaston, and Howard A. Landsman, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 25, 1978, Ser. No. 945,731
Int. Cl.[2] H04N 7/02
U.S. Cl. 358—139 8 Claims



1. A multifrequency burst test signal generator for testing television video equipment, the signal generator comprising:

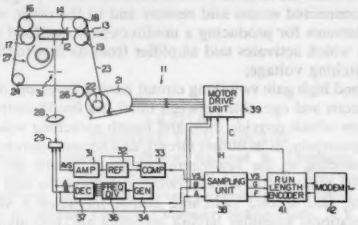
means triggered by a run signal at the television line rate for generating sine wave signals, said sine wave generating means producing individual packets of sine waves at predetermined frequencies; and

means responsive to said run signal and to a ramp signal at the television field rate for progressively delaying the starting point of said sine waves generated by said sine wave generating means.

4,217,611
OPTOELECTRONIC SCANNING APPARATUS

Mutsuo Ogawa, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,107
Claims priority, application Japan, May 16, 1977, 52/56769
Int. Cl.[2] H04N *1/02*
U.S. Cl. 358—294 7 Claims

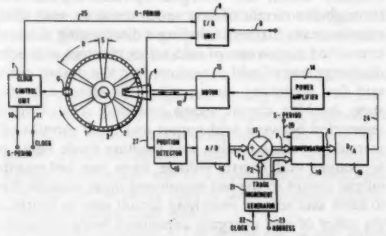


1. An optoelectronic scanning apparatus comprising:
a charge accumulation type linear photosensor array;
optical means for focussing a light image of a linear portion of an original document into the array;
main scan means for continuously scanning the array to thereby scan the document in a main scan direction;
subscan means for continuously producing relative movement between the document and the array by one increment each time the main scan means scans the array to thereby scan the document in a subscan direction which is perpendicular to the main scan direction;
scan enable means for controlling the main scan means and subscan means to begin and continue scanning; and
control means for controlling the main scan means to delay scanning the array while the subscan means produces relative movement between the document and array by one increment when the scan enable means controls the main scan means and subscan means to begin scanning.

4,217,612
SERVO SYSTEM FOR TRACK ACCESSING AND TRACK FOLLOWING IN A DISK DRIVE

Arno Matla, Waldenbuch, and Volker Zimmermann, Schoenaich, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 27, 1978, Ser. No. 963,701
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2759066
Int. Cl.[2] G11B *5/56, 21/08, 21/10*
U.S. Cl. 360—78 7 Claims

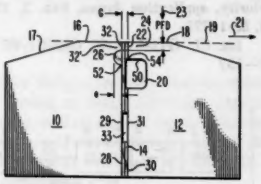


1. A servo system for a disk drive having a magnetic disk recorded with data signals and with interleaved servo signals, a magnetic head for sensing said data and servo signals and a motor for driving said head to access data tracks on said disk comprising:
a position detector for providing first position error signals in response to sensed servo signals;
a track increment generator for generating second position error signals under control of clock and address signals;
a summing circuit coupled to said position detector and to said track increment generator for summing said first and second error signals and for producing a combined position error signal; and
a compensator coupled to said summing circuit and to said track increment generator for providing a compensating signal to said drive motor of said accessing head.

4,217,613
MAGNETIC TRANSDUCER HEAD CORE

Herbert M. Schwartz, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,017
Int. Cl.[2] G11B *5/25, 5/12, 5/42*
U.S. Cl. 360—119 11 Claims



1. In a magnetic head, first and second magnetic elements, each formed with a straight first surface, said elements lying in a common plane with the straight surfaces parallel to and closely spaced from one another, the straight surfaces defining between them a flux gap, each element also being formed with a second surface at approximately right angles to its straight surface the second surfaces of the elements being aligned, said first element being formed with a first notch in its straight first surface close to the second surface thereof, a surface of the notch and a portion of the second surface of the first element defining between them a cantilevered pole piece having a face which faces the second element, a non-magnetic material filling said notch for supporting said pole piece, a non-magnetic coating having a melting point higher than that of a brazing alloy, said coating over each said straight surfaces including said non-magnetic material, an opening in said coating on each of said surfaces at facing first and second portions of said straight surfaces, and said brazing alloy joining said straight surfaces solely at said first and second portions.

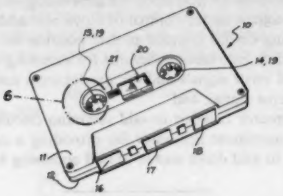
4,217,614
CASSETTE TAPE POSITION INDICATOR

Nicholas Balson, 6/29 Diamond Bay Rd., Vaucluse, New South Walles, Australia (2030)

Filed Jan. 24, 1979, Ser. No. 6,157
Claims priority, application Australia, Feb. 14, 1978, PD3369
Int. Cl.[2] G11B *23/08*
U.S. Cl. 360—132 6 Claims

1. A tape cassette comprising a casing, a pair of spools housed within the casing, a magnetic tape extending between the spools and an indicator for giving indication as to the position of the tape within the casing; said indicator comprising rotatably mounted indicia carrying means associated with and mounted adjacent to at least one of the spools, means within the casing permitting viewing of the indicia on the indicia carrying means, and drive means effecting incremental rota-

tion of said indicia carrying means in response to a predetermined number of revolutions being made by the associated



spool during transport of the tape from one of the spools to the other.

4,217,615

TAPE MEASUREMENT AND POSITION SYSTEM

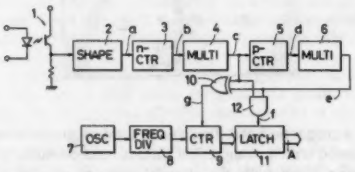
Tsutomu Suzuki, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Feb. 2, 1979, Ser. No. 8,811

Claims priority, application Japan, Feb. 2, 1978, 53-11071; Feb. 2, 1978, 53-11072

Int. Cl.[2] G11B *15/00*; G03B *1/60*

U.S. Cl. 360—137 **17 Claims**



1. A system for detecting tape parameters used in a tape recorder wherein the tape is transferred from a first reel to a second reel at a running velocity v, comprising:

(a) measuring means for measuring a time period for a predetermined number of rotations of one reel having a hub diameter R_H;

(b) first memory means for storing a first time period n_t at a time t measured by said measuring means;

(c) second memory means for storing a second time period $n_{t+\Delta t}$ at a time $t+\Delta t$ measured by said memory means; and

(d) computing means for operating with said first and second time periods n_t and $n_{t+\Delta t}$, a time differential Δt between the time $t+\Delta t$ and t and the tape running velocity v in accordance with the following equation:

$$T=(n_t^{2+\Delta t}-n_t^2)\cdot v/2\pi(n_t-n_{t+\Delta t}+2\Delta t)$$

to thereby calculate tape thickness T.

4,217,616

MOTOR OVERLOAD PROTECTION CIRCUIT

Frank L. Jessup, New Whiteland, Ind., assignor to John Fulling, Greenwood, Ind.

Filed Jun. 12, 1978, Ser. No. 914,555

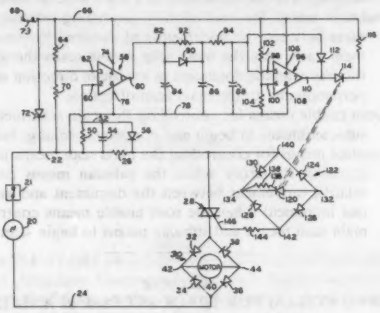
Int. Cl.[2] H02H *7/085*

U.S. Cl. 361—31 **5 Claims**

1. A motor overload protection circuit comprising a first source of alternating voltage; a motor-energizing circuit including a motor and a semiconductor switch connected to said source, said switch having a gating element for determining the state of conductivity thereof, an overload-sensing resistor in series with said motor; a second source of unidirectional voltage; a first high gain switching circuit having input and output circuits and operable between first and second switching states which provide first and second switching voltages, respectively, in said output circuit, said second source being connected to said input circuit and normally biasing said switching circuit to said first state; said switching circuit including a first operational amplifier having inverting and non-inverting input elements which form a part of said input circuit and an output element which forms a part of said output circuit, one of said input elements being connected to said second source to bias said amplifier to the first state; rectifying circuit means connected across said resistor and to the other of said input elements for producing a unidirectional overload signal voltage which activates said amplifier from its first to its second switching voltage;

a second high gain switching circuit having input and output circuits and operable between third and fourth switching states which provide third and fourth switching voltages, respectively, in its output circuit, said second source being connected to the last-mentioned input circuit and normally biasing said second switching circuit to said third state; said second switching circuit including a second operational amplifier having inverting and non-inverting input elements which form a part of said last-mentioned input circuit and an output element which forms a part of the last-mentioned output circuit, one of said second input elements being connected to said second source to bias said second amplifier to the third state;

time delay charging circuit means coupled between the



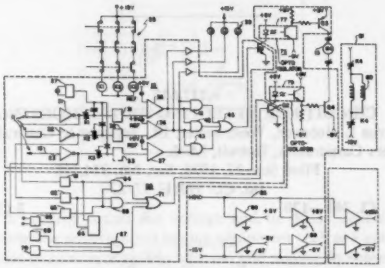
output circuit of said first switching circuit and the input circuit of said second switching circuit operative in response to said second switching voltage to activate said second switching circuit from its third to said fourth switching voltage state, said charging circuit means including two series resistors connected between said first output circuit and said second input circuit and two charging capacitors connected to respective ones of said series resistors which are charged by said second voltage through the circuit of said series resistors, said charging circuit means further including a discharging diode shunt connected across one of said series resistors and poled to discharge one of said capacitors into the output circuit of said first switching circuit when the latter is in its first state; latching circuit means including a latching diode connected between said output and input circuits of said second switching circuit, said latching diode being poled to couple said fourth voltage from the last-mentioned output circuit to the last-mentioned input circuits thereby to latch said second switching circuit into its fourth state, the other of said charging capacitors being connected to said last-mentioned input circuit; a control signal device connected to the last-mentioned output circuit and said second source and responsive to said third and fourth voltages, respectively, to generate first and second control signals, and means for coupling said first and second control signals to said gating element of said semiconductor switch of rendering the latter non-conductive in response

to said second control signal and conductive in response to said first control signal.

4,217,617
TURBINE TRIP CIRCUIT

Anthony J. Rossi, Fitchburg; Richard E. Lundberg, Ashby; Thomas A. Fancy, Westminster; Donald F. Behringer, Ashburnham, and John B. Haven, Lunenburg, all of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,761
Int. Cl.² H02H *7/06*
U.S. Cl. 361—51 **1 Claim**



1. A trip circuit for a rotating shaft prime mover wherein the input of energy into the prime mover may be controlled by a relay operated normally open fast closing valve, said trip circuit comprising:

multiple shaft speed signal inputs including at least three signal inputs indicative of shaft speed; one of said three signal inputs being redundant to itself;

means for detecting an overspeed condition in said prime mover from said shaft speed signal inputs;

means for detecting a failure in said shaft speed signal inputs including retriggerable monostable multivibrators each receiving a shaft speed input whereupon the output of the multivibrator will go low if the shaft speed input falls below a preselected level;

AND gates connected to the multivibrator outputs whereupon a failure and two speed inputs or in the redundant speed input will cause a low output signal;

an OR gate receiving the outputs from the AND gates;

a startup trip interlock logic comprising a start-override time delay; a zero revolution sensing logic; and, a speed sensing circuit, all three outputs being input into an AND gate connected to the failure circuit OR gate whereby during startup of the prime mover a mock signal is input into the OR gate for the delay time or until the prime mover is at a predetermined shaft speed;

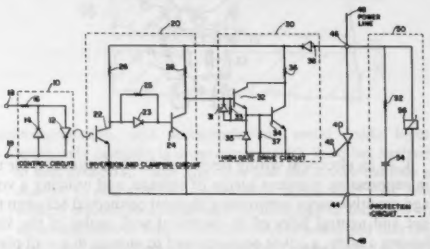
a first switch connected at the output end of said overspeed detecting means; and,

a second switch connected at the output end of said speed input failure detecting means; said control relay interconnected between said first and second switches whereby a trip in the prime mover may be initiated by either an overspeed or speed input failure signal.

4,217,618
THYRISTOR FIRING CIRCUIT MODULE WITH INTEGRAL OPTICAL ISOLATION, DV/DT LIMITATION, AND BIDIRECTIONAL VOLTAGE TRANSIENT SUPPRESSION

Carl W. Kellenbenz, 106 Franklin Ave., Baltimore, Md. 21225, and George R. Boney, 6930 Sollers Point Rd., Baltimore, Md. 21222

Filed Oct. 25, 1977, Ser. No. 845,197
Int. Cl.² H02H *3/20*
U.S. Cl. 361—56 **6 Claims**



1. A circuit for firing a thyristor into its conducting state, said thyristor having an anode electrode, cathode electrode and gate electrode, said circuit and thyristor being connectable to a power supply, said circuit deriving energy from the voltage across said thyristor when said thyristor is in its non-conducting state comprising:

first circuit means for providing a gating signal in response to an input signal and comprising a light emitting diode for radiating light in response to said input signal,

second circuit means for providing a firing signal upon receipt of said gating signal and comprising a phototransistor for detecting the light radiation of said light emitting diode, a first resistor coupled to the collector of said phototransistor for limiting the current in said phototransistor, said phototransistor being drivable into saturation upon detection of said light radiation, a transistor coupled to the collector of said phototransistor, said transistor being saturatable when said phototransistor is non-conducting, and non-saturable when said phototransistor is conducting, said transistor providing said firing signal, and a second diode coupled between the collector of said phototransistor and the base of said transistor for limiting the collector-emitter voltage across said phototransistor and for precluding current flow to the base of said transistor when said photo-transistor is saturated,

third circuit means coupled between said second circuit means and said thyristor for switching said thyristor into a conducting state upon receipt of said firing signal, wherein said third circuit means includes a pair of transistors arranged in a darlington configuration coupled between the anode electrode and gate electrode of said thyristor, said pair of transistors becoming conductive when said phototransistor is saturated and said transistor is non-conductive whereby said thyristor is swtiched into its conductive state; and

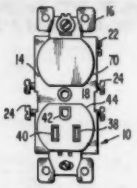
fourth circuit means coupled across said thyristor between its anode and cathode electrodes for protecting said thyristor from misfiring and from being damaged by voltage transients thereacross, wherein said fourth circuit means comprises a parallel combination of a second resistor in series with a capacitor forming an RC snubber circuit across said thyristor for limiting the rate of rise of voltage thereacross, and a varistor in parallel across said RC snubber circuit for controlling forward and reverse voltage transients thereacross.

4,217,619

TRANSIENT VOLTAGE SURGE SUPPRESSING DEVICE

Julius F. Tibolla, Yardley, Pa., assignor to GTE Sylvania Wiring Devices Incorporated, Trenton, N.J.

Filed Jun. 5, 1978, Ser. No. 912,625
Int. Cl.[2] H02H 3/20
U.S. Cl. 361—56 7 Claims



1. In an electrical wiring device of the type intended for use in suppressing transient surges of voltage, and utilizing a voltage-sensitive surge suppressing element connected between the hot and neutral sides of an electrical wall outlet of the kind having a body, a cover proportioned to engage in a wall plate, and contact strips housed within the body, the improvement comprising:

(a) a body exteriorly configured similarly to that of a duplex receptacle installable in an electrical power circuit;

(b) hot and neutral contact strips seated in the body, the strips being provided at one end with attachment-plug-prong-receiving contact means for connecting to the circuit an attachment plug of an electrical appliance, the strips being formed at their other ends with wire lead terminals;

(c) a cover on the body configured similarly to that of a duplex receptacle and cooperating with the body in defining an electrically insulative housing for the contact strips, the cover having raised portions at its ends proportioned to seat in complementarily shaped openings of a duplex receptacle wall plate, the body having a pair of contact compartments underlying one of the raised portions and having a suppressor compartment underlying the other raised portion, the strips extending longitudinally within the body from the contact compartments to the suppressor compartment, said one end of the strips being disposed within the contact compartments and the other ends of the strips being disposed within the suppressor compartments, one of the raised portions having slots registered with the prong-receiving contact means of the strip for insertion of the prongs of an attachment plug, the other raised portion being wholly closed; and

(d) a voltage-surge-suppressing element underlying said other raised portion and having wire leads permanently connected to the respective wire lead terminals of the contact strips.

4,217,620

CIRCUIT FOR CONTROLLING INDUCTION IN CURRENT TRANSFORMERS

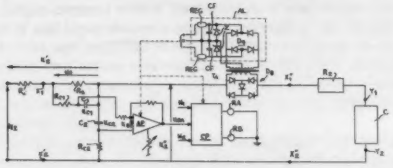
Louis Masson, Ste-Julie, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Sep. 18, 1978, Ser. No. 942,951
Claims priority, application Canada, Feb. 6, 1978, 296342
Int. Cl.[2] H02H 3/20, 7/04
U.S. Cl. 361—58 24 Claims

1. A circuit for controlling induction in a current transformer having a nominal load at its secondary, useful in maintaining said induction below its saturation level in the presence of a primary current having an asymetrical component, comprising:

detection means coupled with the secondary of said current transformer for detecting an increase in said induction in the transformer;

an auxiliary load having a high resistive value and connected to the secondary of said transformer; and



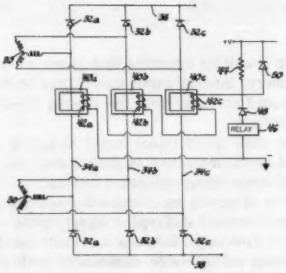
switching means controlled by said detection means so as to insert, in series with the secondary of the transformer and said nominal load, said auxiliary load when the polarity of the current flowing through said switching means becomes opposite to the polarity of said asymetrical component of said primary current.

4,217,621

CIRCUIT FOR DETECTING DIODE SHORTING

Lauren L. Johnson, Westchester, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 22, 1978, Ser. No. 944,758
Int. Cl.[2] H01H 47/22
U.S. Cl. 361—170 2 Claims



1. Means for detecting shorting of a diode in a circuit for rectifying AC current including a conductor in series with the diode and carrying unidirectional current from an AC source, comprising

a current transformer including a saturable core of square hysteresis loop material, a primary winding comprising the said conductor, and a secondary winding,

means consisting of the unidirectional current pulses resulting from normal diode conduction and flowing in the said conductor for saturating said core so that said unidirectional pulses induce substantially no corresponding pulses in the secondary winding and wherein, in the event of a shorted diode, alternating current is applied to said conductor and the resulting reverse current pulses drive the core out of saturation and produce corresponding current pulses in the secondary winding, and

means responsive to current pulses in the secondary winding derived from the reverse current pulses in the said conductor for indicating diode shorting.

4,217,622
CONTROL CIRCUIT FOR UNDERGROUND MINING EQUIPMENT

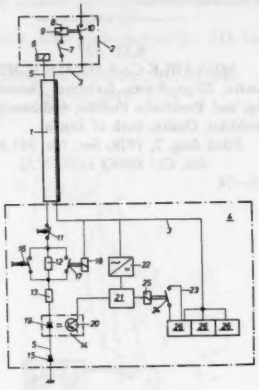
Anton Dinkelbach, Gelsenkirchen, and Karl-Heinz Weber, Witten-Heven, both of Fed. Rep. of Germany, assignors to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,701

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726881

Int. Cl.[2] H02H 7/08

U.S. Cl. 361—175 **5 Claims**



1. A control circuit for voltage and/or phase dependent apparatus for underground mining equipment such as a getting machine or conveyor system wherein said mining equipment is connected through a cable to a power supply switch, monitoring conductor and monitoring relay remotely situated in the mine gallery, said control circuit including the combination of:

a photo-electronic coupler responsive to current in said monitoring conductor for producing an output signal,

a battery fed integrator stage receiving the output signal from said photo-electronic coupler for producing a control signal,

an output relay energized in response to said control signal to control the connection between said power supply cable and said apparatus before operation of said supply switch,

an ON switch serially coupled in said monitoring conductor between said monitoring relay and said photo-electronic coupler,

a first normally open switch serially connected in said monitoring conductor to bridge said ON switch, and

a first relay responsive to an operating voltage delivered by said cable to said apparatus for closing said first normally open switch.

4,217,623
HUMIDITY SENSOR OF CAPACITANCE CHANGE TYPE

Atsushi Nishino, and Akihiko Yoshida, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 5, 1978, Ser. No. 912,714

Claims priority, application Japan, Jun. 6, 1977, 52/67004; Jul. 6, 1977, 52/81397; Jul. 7, 1977, 52/81845

Int. Cl.[2] H01G 7/00

U.S. Cl. 361—286 **22 Claims**

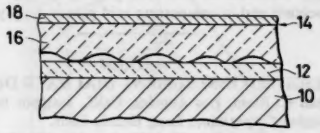
1. A device for measurement of humidity, comprising:

a substrate made of a metal selected from the group consisting of tantalum, aluminum, titanium, zirconium and hafnium, including alloys thereof, said substrate serving as a first electrode;

a dielectric oxide film formed by oxidation of a surface region of said substrate;

a gas-permeable semiconducting metal oxide layer formed on the outer surface of said dielectric film; and

an electrically conducting and gas-permeable layer formed on the outer surface of said semiconducting metal oxide layer serving as a second electrode;



microscopically, said semiconducting metal oxide layer being only partially in close contact with the other surface of said dielectric oxide film such that the device exhibits a change in electrostatic capacitance across said first and second electrodes in response to a change of humidity in an atmosphere to which the device is exposed and that the degree of said change in electrostatic capacitance defined by $(C_{98}-C_{31})/C_{98}$ is greater than 0.01, where C_{98} represents the electrostatic capacitance when said humidity in terms of relative humidity is 98% and C_{31} represents the same at 31% relatively humidity.

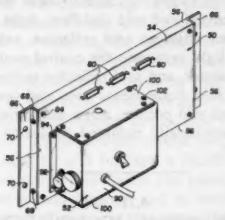
4,217,624
COMMUNICATIONS INTERFACE ADAPTER

Winfree P. Tuck, Huntsville, Ala., assignor to Inteq, Inc., Fairfax, Va.

Filed Jun. 28, 1979, Ser. No. 52,710

Int. Cl.[3] H05K 7/14

U.S. Cl. 361—394 **8 Claims**



1. In a communications interface adapter having a controller means, memory means, a plurality of switch means for providing manual control of said adapter, a plurality of indicator means for indicating operation of said adapter, a first and second connector means for providing input/output terminals for lines to be interfaced, a power supply means and a housing, the improvement comprising:

a printed circuit board having a front plane and a back plane;

said controller means, memory means, plurality of switch means, and plurality of indicator means being mounted to said front plane of said printed circuit board,

said first and second connector means being mounted to said back plane of said printed circuit board;

a third connector means being mounted to said back plane of said printed circuit board for providing terminals for said power supply means;

said housing including a first section for housing said printed circuit board and a second section for housing said power supply means;

said first housing section having a closed generally rectangular configuration with face aand rear portions parallel to said front and back planes of said printed circuit board,

said face portion including a plurality of apertures each aligned with a respective switch means or indicator means, said rear portion including a plurality of openings each aligned with a respective connector means;

said printed circuit board being mounted in and enclosed by said first housing section;

said power supply means being removeably connected to said third connector means external to said first housing section; and said second housing section being removeably mounted to said rear portion of said first housing section and encompassing said power supply means.

4,217,625

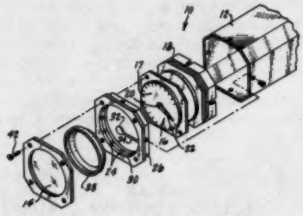
LIGHTED INSTRUMENT DIAL FACE DISPLAY

Herman C. Klein, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 27, 1978, Ser. No. 955,471

Int. Cl.[2] G01D *11/28*

U.S. Cl. 362—30 **21 Claims**



1. A front lighted display system for an instrument dial face and pointer, which comprises in combination with said dial face and pointer, a lighting head, a plurality of light emitting diodes positioned around the periphery of said lighting head and disposed to emit light rays directly onto said face, a reflector mounted centrally of said dial face, light emitting diode means positioned adjacent said reflector, said diode means emitting direct light rays onto the central portion of said dial face and said pointer, and said reflector redirecting reflected light rays from said diode means onto said central portion of said dial face and said pointer, and a baffle ring positioned in front of said peripherally mounted diodes to prevent direct viewing thereof.

4,217,626

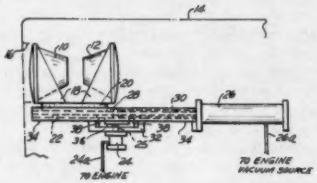
AUTOMOBILE HEADLIGHT CHANGE SYSTEM

Edward A. Bindle, 5209 Flushing Rd.; Julius E. Theriault, 5251 Flushing Rd., both of Flushing, Mich. 48433, and Wesley J. Toll, 6179 David Berger St., Mt. Morris, Mich. 48458

Filed Sep. 25, 1978, Ser. No. 945,611

Int. Cl.[2] B60Q *1/02, 1/08*

U.S. Cl. 362—67 **5 Claims**



1. An automobile headlight change system, comprising:

a automobile engine vacuum source;

a slide mounted in the fender of the automobile and slidable reciprocally forwardly and backwardly;

a rotatable disk mounted on said slide;

a notched plate operatively connected to said disk for controlling its rotation;

a pair of headlights mounted on said disk, one facing forwardly in an operative position and the other facing rearwardly in a storage position.

a first pneumatically operated cylinder operatively connected to at least one pin for raising said pin to a notched portion in said notched plate; and

a second pneumatically operated cylinder operably coupled to said slide for moving it rearwardly and then forwardly in said fender whereby the notched plate and disk are rotated through a 180° turn, both of said cylinders coupled to said vacuum source.

4,217,627

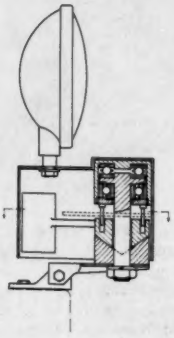
MOVABLE CAR HEADLIGHTS

Kazumi Tomita, 22-go, 5-ban, 1-chome, Tamatsu, Higashinariku, Osaka, and Yoshitaka Fujiike, 400-banchi, Tamatsukuricho, Higashi-ku, Osaka, both of Japan

Filed Aug. 7, 1978, Ser. No. 931,440

Int. Cl.[2] B60Q *1/08, 1/12*

U.S. Cl. 362—71 **7 Claims**



1. A movable car-headlight device located at an appropriate place on a car body, for automatically illuminating an area into which said car turns, which comprises:

(a) bracket means mounted on a forward portion of said car for mounting said headlight device thereon;

(b) receiving table means mounted on said bracket means, said receiving table means having a vertically extending opening therethrough and having a V-shaped wedge upper surface;

(c) a rotating body rotatably supported on said receiving table means and having a vertically extending opening therethrough which is co-extensive with said opening in said receiving table means, the bottom portion of said rotating body being V-shaped complimentary to said V-shaped upper surface of said receiving table means for contacting and being supported by said V-shaped upper surface of said receiving table, said rotating body further having engaging means located on its upper surface;

(d) lever means extending horizontally and angularly spaced from each other in a direction toward the rear of said car and attached to said rotating body and having weight balance means attached to the ends furthest from said rotating body;

(e) axle means having a rod portion extending downward through said openings in said rotating body and said receiving table means and secured to said bracket;

(f) casing means attached to said rotating body by said rotating body engaging means; and

(g) a headlight mounted on said casing means whereby rotation of said headlight is caused by centrifugal force acting upon said weight balance means when said car is

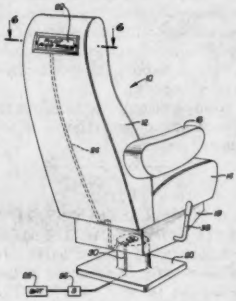
turned thereby causing said rotating body to turn and climb up said V-shaped surface portion, thereby rotating said casing means having said headlight mounted thereon, said headlight being rotated back to its original position once said car completes said turn and centrifugal force no longer acts on said weight balance means.

4,217,628

ELECTRICAL LIGHTING SYSTEM FOR ROTATING CHAIR

Kenneth R. Windom, 4200 Santo-Tomas Dr., #D, Los Angeles, Calif. 90008

Filed Apr. 3, 1978, Ser. No. 893,046
Int. Cl.² A47C 7/72
U.S. Cl. 362—75 **3 Claims**



1. A lighted identification system for incorporation with a chair comprising:

(a) a swivel chair having a back portion and a seat portion, said chair being of the type having a high styled back as often used on van-type vehicles;

(b) a lighted display mounted in the back portion of said chair;

(c) a base for said chair, including a mounting seat plate, said seat portion of said chair being linearly movable relative to said mounting seat plate and said stand having an opening;

(d) a mounting stand connected to said base, said stand adapted to be attached to the floor of the vehicle, and having an opening alignable with the opening in said base;

(e) a tube connected in a generally vertical disposition to said mounting stand;

(f) a bolt positioned through said opening in the stand and the base for rotatably connecting said chair and stand;

(g) a nut attached to said bolt;

(h) a washer positioned about said bolt and located between said nut and said plate;

(i) a connector including an electrically conductive element embedded within an insulative synthetic resin, said connector having upper and lower arms and an arcuate body being somewhat less than semi-cylindrical whereby an electrically conductive path may be formed between the lighted display and the power source while allowing said chair to swivel;

(j) a first electrical conductor disposed between said lighted display and said connector and located within the back portion of said chair; and

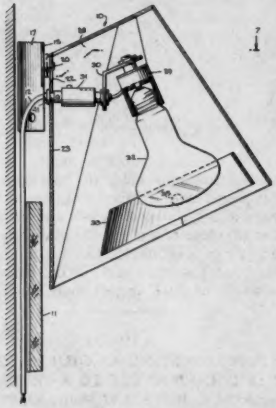
(k) a second electrical conductor disposed between said connector and a power source, said second conductor positioned through said tube.

4,217,629

CORNER LIGHTING ASSEMBLY

James P. Russell, 123 Park Ave., Verona, N.J. 07044

Continuation of Ser. No. 784,137, Apr. 4, 1977, abandoned. This application Jan. 26, 1979, Ser. No. 6,884
Int. Cl.² F21S 1/14, 3/06; F21V 21/00
U.S. Cl. 362—147 **12 Claims**



1. A corner lighting portable lamp assembly comprising a bracket member constructed for mounting in a corner of a room at any selected height between the floor and ceiling, said member having means for enabling it to be fastened in said corner to adjacent walls of the room and having a support member for disposition catercorner across said corner, a shade-like lamp housing containing a bulb socket and constructed and arranged to conceal said socket and any installed bulb from view horizontally while directing in a generally downward direction the illumination from said bulb, said housing having angled rear walls for adapting the housing to be located close within said corner, the rear of said housing being truncated to provide clearance between the rearmost part of the housing and said corner of the room, means located on the truncated rearmost portion of said housing and on said support member of said bracket for pin-up non-permanent interengagement to secure said housing to said bracket, a flexible electric cord connected at one end to said socket and passing through said rearmost portion of said housing, and an electric attachment plug at the free end of said cord for connecting said assembly to an electric outlet.

4,217,630

FLUORESCENT LAMP BASE ASSEMBLY

Wolfgang Albrecht, Berlin, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,657
Claims priority, application Fed. Rep. of Germany, Dec. 28, 1976, 2659167
Int. Cl.² F21S 3/00
U.S. Cl. 362—217 **14 Claims**

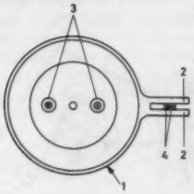
1. In a U-shaped fluorescent lamp having a U-shaped envelope 7') including a pair of essentially parallel leg portions, a base assembly, comprising

two bases (1, 1), each being connectable to a respective end (7) of said envelope (7'), each base having a bottom (1*a*), a cylindrical, upwardly directed flange (8) extending from said bottom, and contact means (3);

a pair of substantially parallel, radially outwardly projecting members (2, 2) laterally extending from each of said bases, each pair of projecting members having mutually facing

surfaces, the pairs of projecting members extending toward each other from the respective bases;

means (4) extending from at least one of said mutually facing surfaces toward the other of said mutually facing surfaces of each pair of projecting members; and



an elongated spacer member (5) having respective ends, slidably engageable between mutually facing surfaces of the pairs of projecting members, and being formed with notches (6) close to its ends for positively engaging said extending means (4) interconnecting the two bases (1, 1) together and positively spacing the bases (1, 1) on the envelope (7') of the U-shaped lamp from each other.

4,217,631

DEVICE FOR ADJUSTING AN OBJECT TO ASSUME A PREDETERMINED ANGLE TO A CERTAIN PLANE

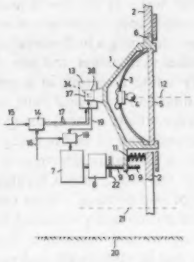
Lars A. Bergkvist, Gottne, 890 42 Mellansel, Sweden

Filed Oct. 11, 1977, Ser. No. 840,891

Claims priority, application Sweden, Oct. 15, 1976, 7611514

Int. Cl.[2] F21V *7/00*

U.S. Cl. 362—348 **7 Claims**



1. A device for adjusting the angular disposition of a first object relative to a plane, the first object being adjustably fixed to a second object positioned on said plane, the adjustment of said first object occurring when there is a change in the angular disposition of the second object relative to the plane, the adjustment of said first object being variable independently of the angular disposition of the second object relative to the plane and of the angular disposition of the plane relative to horizontal, the angular disposition of the first object relative to the plane having been set to a predetermined angle prior to the change in the angular disposition of the second object relative to the plane, said device comprising,

a first member coupled to the first object, said first member being freely rotatable in a direction substantially parallel to the angle to be adjusted between the first object and the plane, said first member having a center of gravity which determines a rotary position thereof relative to vertical when said first member is rotationally at rest, and said first member remaining in said rotary position during the change in the angular disposition of the second object relative to the plane;

a second member coupled to said first object, said second member being freely rotatable in a direction substantially parallel to said first member and being located adjacent said first member, and said second member having a center of gravity which determines a rotary position thereof relative to vertical and relative to the rotary position of said first member when said second member is rotationally at rest;

locking means fixed to said first object and coupled to said second member for temporarily fixing the rotation of said second member relative to said first object during a time substantially beginning with the change in the angular disposition of the second object relative to the plane and substantially ending with the adjustment of said angular disposition and the first object relative to the plane, said second member when in its fixed rotative disposition relative to said first object being rotated from its rotary position and relative to the rotary position of said first member by the change in the angular disposition of the second object relative to the plane;

indicator means coupled to said first member and said second member for producing a control signal in response to the difference in the rotational position of said second member relative to said first member;

adjustment means coupled to said first object, said second object and said indicator means, said adjustment means for adjusting said first object and said second object relative to each other in response to said control signal to return said second member to

the rotary position thereof and to adjust the angular disposition of said first object relative to said plane to said predetermined angle.

4,217,632

REGULATED POWER SUPPLY SYSTEM INCLUDING SATURABLE REACTOR MEANS

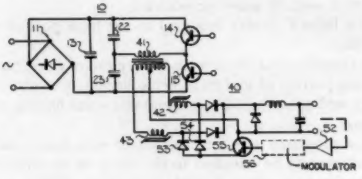
Peter A. Bardos, and John E. Crowe, both of Bishop's Stortford, England, assignors to Gould Advance Limited, Essex, England

Filed Jul. 10, 1978, Ser. No. 923,317

Claims priority, application United Kingdom, May 19, 1978, 20881/78

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—26 **6 Claims**



1. Regulated power supply apparatus, comprising:

(a) a source of unidirectional current;

(b) a half-bridge inverter circuit including a pair of switching devices connected in series with said unidirectional current source and arranged to provide a periodically inverted voltage at the junction between said two switching devices, said inverter circuit further including transformer means receiving said periodically inverted voltage for providing antiphased outputs;

(c) first and second saturable reactors (42, 43) connected with the antiphased outputs of said transformer means, respectively;

(d) first and second rectifier diodes (44, 45) having first terminals connected with said first and second saturable reactors, respectively, the other terminals of said rectifier diodes being connected together to provide an output voltage; and

(e) low impedance control means responsive to said output voltage for controlling said first and second saturable reactors between substantially saturated and substantially

unsaturated conditions, said low impedance control means including

(1) a low impedance device having an output terminal; and

(2) first and second control rectifying means (53, 54) connecting said low impedance output terminal with the junctions between said first and second saturable reactors and said first and second rectifier diodes, respectively, thereby providing compensation for asymmetry in said periodically inverted output voltage of said inverter circuit.

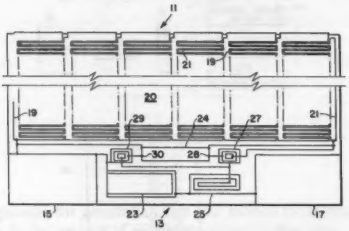
4,217,633
SOLAR CELL SYSTEM HAVING ALTERNATING CURRENT OUTPUT

John C. Evans, Jr., Ravenna, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D. C. 20546

Continuation-in-part of Ser. No. 915,050, Jun. 9, 1978, abandoned. This application Aug. 10, 1979, Ser. No. 65,675

Int. Cl.[3] **H02M** *3/315;* **H01L** *31/06*

U.S. Cl. 363—27 **5 Claims**



1. A solar cell system having an alternating current output comprising

a monolithic solar cell comprising a semiconductor body having a plurality of voltage generating regions connected in series to provide a direct current potential, and

integrated circuit means incorporated in said semiconductor body along an edge thereof and including a plurality of rectifiers and transistors for changing the direct current power to alternating current power.

4,217,634
VOLTAGE AND CURRENT SOURCES

Robert J. Dalley, Yateley, and Robert D. Owen, Farnborough, both of England, assignors to Sangamo Weston, Inc., Norcross, Ga.

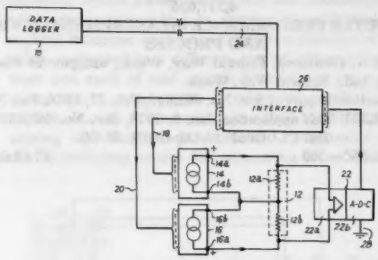
Filed Aug. 28, 1978, Ser. No. 937,301

Claims priority, application United Kingdom, Sep. 5, 1977, 36918/77

Int. Cl.[2] **H02M** *7/02*

U.S. Cl. 363—89 **11 Claims**

1. A voltage source for providing a d.c. output voltage the magnitude of which is to be controlled by an input signal comprising generating means arranged to respond to said input signal and to a feedback signal to generate an oscillatory signal having an amplitude dependent upon the difference between said input and feedback signals; coupling means having an input responsive to said generating means and a plurality of outputs and arranged to couple the oscillatory signal from said input to said outputs such that the amplitude of the signal at one output is in a predetermined ratio to the amplitude of the signal at another output and said one output is isolated against direct electrical contact from both said other output and said input; and first and second rectifying means having substantially identical operating characteristics, the first rectifying means being arranged to receive the signal at said other output of the coupling means to derive said feedback signal and the



second rectifying means being arranged to receive the signal at said one output to derive said d.c. output voltage.

4,217,635
CONTROL CIRCUIT ADAPTED TO CONTROL MOVEMENT OF A PINTLE RELATIVE TO A DIE HEAD

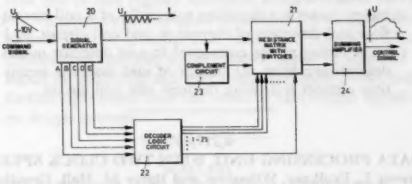
Herbert Handte, Filderstadt, and Friedrich Kollmar, Grafenau, both of Fed. Rep. of Germany, assignors to Moog GmbH, Böblingen, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 507

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800441

Int. Cl.[2] **G06G** *7/66;* **G05D** *5/03;* **B28B** *21/52*

U.S. Cl. 364—117 **13 Claims**



1. A control circuit arranged to receive a command signal input and operative to produce a control signal output, said control signal being adapted for use in controlling the movement of a pintle relative to the die head of extrusion apparatus, said control circuit comprising:

a signal generator arranged to be supplied with said command signal and operative to produce a first output signal in the form of a series of continuous voltage triangles;

a complement circuit arranged to receive said signal generator first output signal and operative to shift the phase of same by half the width of one triangle;

an impedance matrix having a plurality of potentiometers arranged in a numerical order, each of the odd-numbered potentiometers being supplied with said signal generator first output signal, each of the even-numbered potentiometers being supplied with the output signal from said complement circuit;

a summing amplifier connected to each potentiometer in said order and operative to produce a control signal representative of the summed signals received from said potentiometers;

a corresponding plurality of normally-open switches, each switch being operatively associated with a potentiometer to interrupt the signal from the associated potentiometer to said summing amplifier; and

sequencing means operative to selectively close each switch sequentially during overlapping time intervals such that only two numerically-adjacent potentiometers will be

connected to said summing amplifier at any time during the cycle of operation.

4,217,636

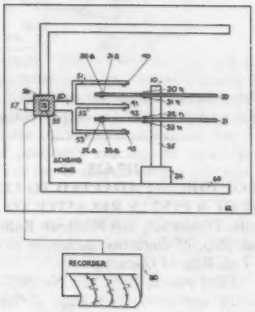
COMPUTER PERFORMANCE MEASUREMENT DEVICE AND PROCESS

Edward A. Olmstead, Federal Way, Wash., assignor to Black Bocs, Ltd., Federal Way, Wash.

Continuation-in-part of Ser. No. 662,013, Feb. 27, 1976, Pat. No. 4,068,302. This application Jan. 9, 1978, Ser. No. 868,033

Int. Cl.[2] G06F *11/00*; G01R *19/00*

U.S. Cl. 364—200 **27 Claims**



1. A device for obtaining data about the performance of a computer disc information storage device having a coil and armature for moving the read-write heads of said storage device comprising

detector means for detecting externally of a coil circuit the flow and direction of current in said coil circuit, and

current timing means connected to said detector means for determining from the output of said detector means the time current is flowing through said coil circuit.

4,217,637

DATA PROCESSING UNIT WITH TWO CLOCK SPEEDS

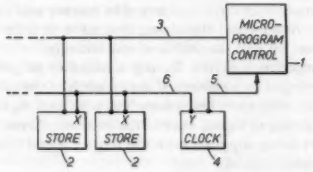
Trevor L. Faulkner, Wilmslow, and Barry M. Hall, Grantham, both of England, assignors to International Computers Limited, London, England

Filed Apr. 10, 1978, Ser. No. 894,852

Claims priority, application United Kingdom, Apr. 20, 1977, 16380/77

Int. Cl.[2] G06F *1/04, 9/02, 5/06*

U.S. Cl. 364—200 **2 Claims**



1. A data processing system comprising:

(a) a control unit

(b) a plurality of store units each of which is of either a first type of relatively fast access speed or second type of relatively slow access speed, each of the store units being removably connected to and accessible by the control unit,

(c) each store unit having indicating means forming an integral part thereof and providing an indication having a first value in the case where the store unit is of said first type and a second value in the case where the store unit is of said second type

(d) means for combining the indications from the store units to produce a control signal which has a first level if all said indications have said first value and a second level if any one of said indications has said second value, and

(e) a clock unit responsive to said control signal for producing clock pulses at a rate corresponding to the access speed of store units of the first type when the control signal has said first level, and producing clock pulses at a rate corresponding to the access speed of store units of the second type when the control signal has said second level.

4,217,638

DATA-PROCESSING APPARATUS AND METHOD

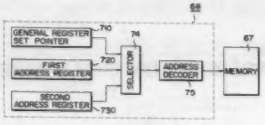
Keiji Namimoto, Yokohama; Seiji Eguchi, Kawasaki, and Yutaka Murao, Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

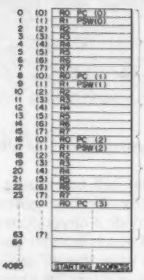
Filed May 19, 1978, Ser. No. 907,856

Claims priority, application Japan, May 19, 1977, 52/57100; May 19, 1977, 52/57101; May 19, 1977, 51/57102

Int. Cl.[2] G06F *9/18, 13/00*

U.S. Cl. 364—200 **10 Claims**





1. In a data processing system having a central processing unit including an internal memory containing a plurality of addressable register locations and means for addressing said register locations in response to address data contained in specified addressing registers, the combination comprising:

a pointer address register containing a first general register set pointer code designating a first group of register locations in said internal memory, at least two of said locations in said first group containing a program counter word and a program status word applicable to a first program;

a first address register containing a register address code designating a selected register location within the group of register locations designated by said pointer code;

means for combining the address codes from said pointer address register and said first address register to combine said first address pointer and address codes to form a first address for accessing said selected register location within said first group of register locations in said internal memory through said means for addressing during execution of said first program;

means for detecting a request to initiate execution of a second program;

means for entering a second general register set pointer code into said pointer address register in response to said request, said second code designating a second group of register locations in said internal memory, at least two of

said locations in said second group containing a program counter word and a program status word applicable to said second program; and

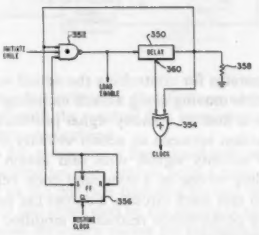
means for enabling said means for combining the address codes from said pointer address register and said first address register to combine said second pointer and address codes to form a second address for accessing said selected register location within said second group of locations in said internal memory through said addressing means during execution of said second program.

4,217,639

LOGIC FOR GENERATING MULTIPLE CLOCK PULSES WITHIN A SINGLE CLOCK CYCLE

Henry F. Hartley, Lowell, and Ralph G. Schuberth, Bedford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Oct. 2, 1978, Ser. No. 947,986
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **15 Claims**



1. Apparatus for generating first and second clock pulses in response to the receipt of an initiate signal comprising:

A. first gate means having at least an output, a first input and a second input, wherein said first input is coupled to receive said initiate signal;

B. delay means having an input, an output and an electrical connection means at a predetermined delay point, said input of said delay means coupled to said output of said first gate means, and said output of said delay means coupled to said second input of said first gate means;

C. second gate means having a first and second input and an output, said first input of said second gate means coupled to said predetermined delay point, said second input of said second gate means coupled to said output of said delay means;

D. means, responsive to said initiate signal and including said first gate means, and second gate means and said delay means, for producing said first and second clock pulses at the output of said second gate means.

4,217,640

CACHE UNIT WITH TRANSIT BLOCK BUFFER APPARATUS

Marion G. Porter; Charles P. Ryan, and William A. Shelly, all of Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

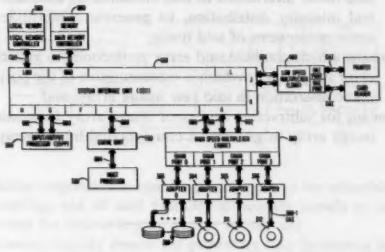
Filed Dec. 11, 1978, Ser. No. 968,522
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **37 Claims**

1. A cache unit for use with a data processing unit for providing fast access to information fetched from a main store coupled to said cache unit in response to commands received from said data processing unit, each command including a command code and an address, said cache unit comprising:

a buffer store including a plurality of addressable word locations for storing said information;

a transit block buffer including a first number of register locations, each including a number of bit positions for storing at least a predetermined portion of said address for each outstanding command having a command code specifying a predetermined one of a plurality of operations;

comparator circuit means having first and second plurality of inputs corresponding in number to said number of register locations, each one of said first plurality of inputs being connected to a different one of said register locations and each of said second plurality of inputs being connected in common to receive said portion of said address as each command is generated by said data processing unit during operation, said comparator circuit means including means for generating an output signal



upon the detection of an identical comparison between a corresponding address portion of each command generated by said data processing unit having a command code specifying any one of said predetermined plurality of operations and said portion of said address stored in at least one of said register locations; and,

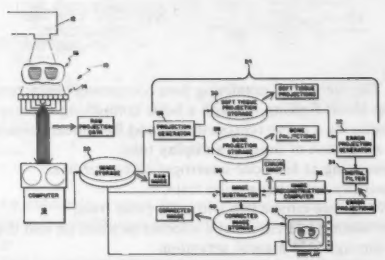
control means coupled to said comparator circuit means and to said data processing unit, said control means being operative in response to said output signal to generate a signal for inhibiting said processing unit from performing further operations until the cause of said output signal is no longer present.

4,217,641

CORRECTION FOR POLYCHROMATIC X-RAY DISTORTION IN CT IMAGES

Abraham Naparstek, Shelton, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 28, 1978, Ser. No. 901,212
Int. Cl.[2] G01N *23/00*; G01T *1/16*
U.S. Cl. 364—414 **16 Claims**



1. A computerized tomographic system for measuring characteristics of and imaging, body tissue comprising:

scanning means which generate projections of said tissue by directing a known spectrum of radiation through said body and measuring the spatial intensity distribution of radiation traversing said tissue along a multiplicity of paths;

image generating means which calculate the attenuation of each pixel element of a raw image array, which is representative of a tranverse section of said tissue, from said projections;

means which analyze values in said raw image array and assign to each pixel element, on the basis of those values, a specific proportion of the attenuation coefficient to each of two or more constituents of said tissue;

means which combine said element proportions to generate a multiplicity of constituent projections for each of said constituents of said tissue;

means which combine said constituent projections, in accordance with a predetermined function approximating the non-linear interaction of said constituents with said spectral intensity distribution, to generate a multiplicity of error projections of said tissue;

means which combine said error projections to generate an error image array which is representative of the polychromatic aberration in said raw image array; and

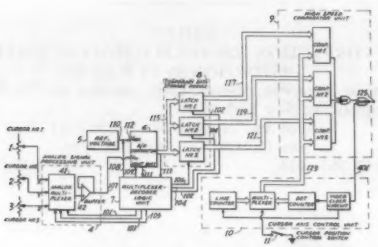
means for subtracting said error image array from said raw image array to generate a compensated image array.

4,217,642

METHOD AND APPARATUS FOR LOCATING DATA CHARACTERIZING BLOOD FLOW THROUGH THE HEART

Naim G. Dam, Bayside; Thomas Picunko, Scarsdale, both of N.Y., and Henry H. Kramer, Moraga, Calif., assignors to Bios Inc., Valhalla, N.Y.

Filed Sep. 13, 1978, Ser. No. 941,903
Int. Cl.[2] A61B 5/02; G06F 3/14
U.S. Cl. 364—416 **6 Claims**



1. The method of examining data concerning characteristics of the blood flowing through a heart comprising the steps of:

displaying a curve representing blood flow measurements as a function of time on a display tube,

generating at least one interrogating cursor line,

manually actuating a pulse train,

driving said cursor line with said pulse train,

positioning said cursor at a selected location on said display through said manual actuation,

automatically interrogating said curve where intercepted by said cursor, when said cursor is positioned at said selected location, to provide data,

computing the value of a predetermined parameter of a patient's blood flow from said data, and

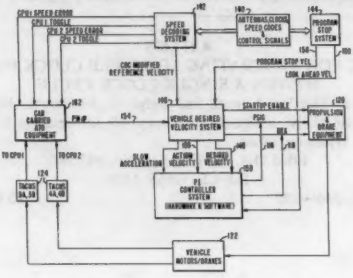
displaying said computed value of said predetermined parameter substantially simultaneous with the interrogation of said curve.

4,217,643

SPEED MAINTAINING CONTROL OF TRAIN VEHICLES

Larry W. Anderson, and Arun P. Sahasrabudhe, both of West Mifflin, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1978, Ser. No. 920,319
Int. Cl.[2] B61L 3/20, 27/04
U.S. Cl. 364—426 **11 Claims**



5. In apparatus for controlling the actual velocity of a passenger vehicle moving along a track including track circuits in response to a desired velocity signal provided in accordance with a selection between an action velocity signal and a program stop velocity signal, with said action velocity signal corresponding to one of a command code velocity signal received from said track circuits, a cutout car modified velocity signal and a performance restriction modified velocity signal, the combination of

means coupled with said vehicle for providing an actual velocity signal,

means for providing an effort request signal for controlling the actual velocity of said vehicle by comparing the desired velocity signal with the actual velocity signal,

means for detecting an overspeed operation of the passenger vehicle for applying a brake effort to reduce the velocity of the vehicle until the overspeed operation is corrected and then removing said brake effort such that by the time the brake effort is actually removed the vehicle will be at substantially the velocity of operation determined by said effort request signal, and

means coupled with said vehicle and responsive to said effort request signal for controlling the actual velocity of the vehicle.

7. In apparatus for controlling the actual velocity of a passenger vehicle in accordance with at least one of an input command velocity signal, an input modified velocity signal and an input program stop velocity signal, and providing a first velocity signal in accordance with a selected one of said input velocity signals, the combination of

means coupled with said vehicle for providing an actual velocity signal,

means for providing an effort request velocity signal for controlling the actual velocity of said vehicle in response to the first velocity signal and the actual velocity signal, with said effort request velocity signal providing means including a controller having a proportional operation and an integral operation,

means for determining the integral operation in relation to the proportional operation such that when the controller is in saturation the integral operation is substantially zero to prevent said integral operation from causing an overspeed or an underspeed of the passenger vehicle, and

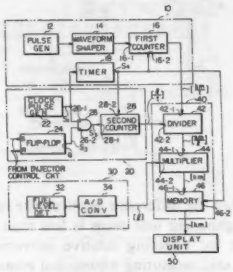
means coupled with said vehicle and responsive to said effort request signal for controlling the actual velocity of said vehicle.

4,217,644

APPARATUS FOR INDICATING THE DISTANCE OVER WHICH A VEHICLE CAN TRAVEL WITH THE RESIDUAL FUEL

Yoshiaki Kato, and Hirotsugu Yamaguchi, both of Fujisawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 28, 1978, Ser. No. 973,965
Claims priority, application Japan, Jan. 14, 1978, 53-2931
Int. Cl.[2] G01M *13/26*
U.S. Cl. 364—442 7 Claims



1. An apparatus for indicating the distance over which a vehicle can travel with the residual fuel remaining in the fuel tank of said vehicle, comprising:

(a) first means for producing a first signal indicative of the distance travelled by said vehicle with a unit amount of fuel in view of the distance travelled by said vehicle and the amount of fuel consumed by the engine of said vehicle, said first means including means for producing a second signal indicative of the distance travelled by said vehicle per a predetermined period of time, means for producing a third signal indicative of the amount of fuel supplied to said engine per said predetermined period of time, and means for dividing said distance indicated by said second signal by said amount of fuel indicated by said third signal, said means for producing said third signal including means for measuring the period of time for which fuel injectors of said engine are actuated, said measuring means including a clock pulse generator, a flip-flop responsive to the operation of said fuel injectors, gate means responsive to the flip-flop output signal for transmitting the clock pulses for a period of time for which said fuel injectors are energized, and a counter for producing said third signal by counting the number of pulses transmitted via said gate means for said predetermined period of time;

(b) second means for producing a fourth signal indicative of the amount of fuel contained in the fuel tank of said vehicle;

(c) third means for producing a fifth signal indicative of the distance over which said vehicle can travel with the amount of fuel remaining in said fuel tank by multiplying said first signal by said fourth signal; and

(d) fourth means for displaying said distance indicated by said fifth signal.

4,217,645

BATTERY MONITORING SYSTEM

George H. Barry, 21225 Saratoga Hills Rd., Saratoga, Calif. 95070, and Ernest A. Dahl, 3247 Breaker Dr., Ventura, Calif. 93003

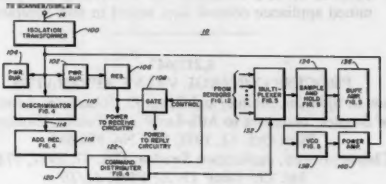
Filed Apr. 25, 1979, Ser. No. 33,286
Int. Cl.[2] G08B *19/00*
U.S. Cl. 364—483 5 Claims

1. A system for automatically monitoring a plurality of parameters of a plurality of cells in a many-cell battery system, which comprises:

a. a plurality of transponder means responsive to a frequency pattern corresponding to a digital command, each transponder means having a unique address associated with each of said plurality of cells for providing a signal having a frequency related to a selected one of said parameters, said transponder means including:

b. a plurality of sensor means for measuring said plurality of parameters, each said sensor means providing an analog signal having an amplitude related to the value of one of said parameters;

c. means for converting an analog signal to a signal having a frequency related to the amplitude of said analog signal; and



d. means responsive to said frequency pattern for selectively coupling one of said plurality of analog signals to said means for converting an analog signal; and

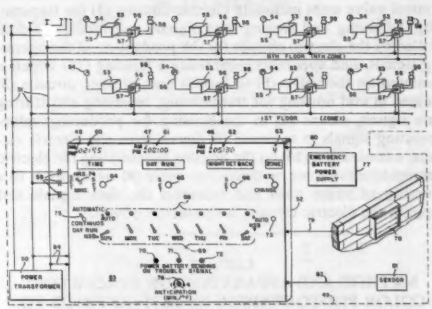
e. scanner/display means for providing said frequency pattern corresponding to a digital command to each of said transponders to selectively couple one of said plurality of analog signals to said means for converting in a selected one of said transponders, said scanner/display means being responsive to said signal having a frequency related to the value of said parameter for providing a visual indication of operational status of plurality of cells.

4,217,646

AUTOMATIC CONTROL SYSTEM FOR A BUILDING

Anthony V. Caltagirone; George J. Bradford, both of York, Pa., and James J. Parro, Skaneateles, N.Y., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 21, 1978, Ser. No. 971,980
Int. Cl.[2] G05D *23/32;* H04Q *7/00*
U.S. Cl. 364—493 52 Claims



1. An automatic system for controlling the environmental conditions in a building divided into a plurality of zones comprising:

at least one power consuming appliance in each zone;

said building including power means for supplying operating power to said appliances;

a control station including means for applying onto said power means appliance control signals that include bursts of radio frequency oscillations having a predetermined frequency and a predetermined duration;

said frequency of said control signals identifying the zone in

which said appliances are to be controlled and the duration of said control signals identifying the function to be performed by said appliances in said identified zone;

a receiver coupled between each said appliance and said power means for receiving said control signals and controlling said appliances in response thereto; and

each said receiver in a zone being responsive only to the control signals having a frequency associated with the zone in which said receiver is located;

said control station including a programmable computer for generating said control signals to control said appliances in said zones in a predetermined manner;

said control station including manually actuatable means coupled to said computer for overriding the predetermined appliance control data stored in said computer.

4,217,647

PROCESS CONTROL VALVE APPARATUS

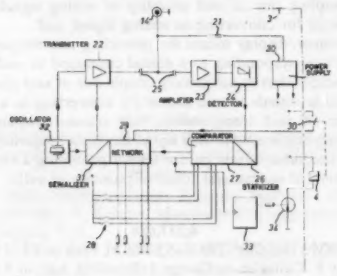
Claes B. Sjöholm, Malmö, and Bengt O. Johansson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 12, 1978, Ser. No. 950,649

Claims priority, application Sweden, Oct. 17, 1977, 7711656

Int. Cl.[2] G06F *15/20;* **F16K** *11/10*

U.S. Cl. 364—510 **4 Claims**



1. An apparatus for use in a process control system equipped with a computer and having a plurality of process control valve units which convert control signals from the system computer into operating signals for one of the valves, said control valve units including electric circuits (3) for transmitting, receiving and storing data signals and means (4) controlled by the electric circuits for the production of the operating signals, said apparatus comprising a housing (11) which is mounted on the valve (5) to form a unit, electric circuits (3) located in said housing for transmitting, receiving and storing data signals, means (4) in the housing for producing valve-operating signals in response to signals from the electric circuits, a connection (14) on the housing for coupling the electric circuits to a two-core or three-core cable (8) which leads to a plurality of valve units and transmits the data signals and supplies the electric circuits with electric power.

4,217,648

METHOD AND APPARATUS FOR EVALUATING COLOR PHOTOGRAPHIC NEGATIVES PRIOR TO COPYING

Siegfried Thurm, Voiswinkel, and Konrad Bunge, Cologne, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

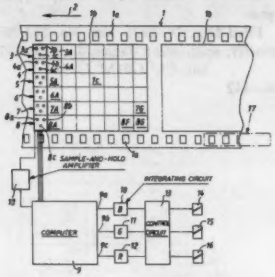
Filed Oct. 16, 1978, Ser. No. 951,989

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1977, 2747527

Int. Cl.[2] G01J *1/10*

U.S. Cl. 364—526 **10 Claims**

8. Apparatus for evaluating color photographic negatives prior to integral copying, comprising means for photoelectrically measuring the density of each of a plurality of unit areas of a color negative in each of the primary colors; means for comparing the results of measurements of neighboring unit areas and for transmitting signals denoting the results of measurements in each of said colors for one of such neighboring



unit areas when the difference between the results of measurements of neighboring unit areas is less than a predetermined value; means for effecting relative movement between the negative and said measuring means; and means for storing said signals for each of said colors.

4,217,649

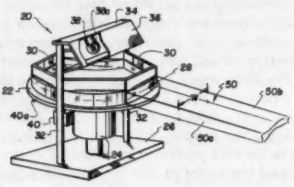
DIGITIZER FOR LOCATING THE POSITION OF A STYLUS POINT ON A WRITING SURFACE

George J. Doundoulakis, 2498 Kayron La., North Bellmore, Long Island, N.Y. 11710

Filed Oct. 11, 1978, Ser. No. 950,389

Int. Cl.[2] G01B *15/00;* **G01C** *15/02*

U.S. Cl. 364—556 **19 Claims**

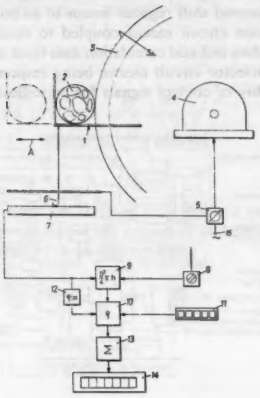


1. A digitizer for locating the position of a stylus point on a surface and converting it to digital information comprising, rotating light projector means for projecting a single light beam having two spaced apart light boundaries and for producing a first information impulse, light sensing stylus means for sensing the passing of said light boundaries and producing a second information impulse, and logic circuit means connected between said projector means and said stylus means for converting said first and second information impulses into digital information as to the position of said stylus, said projector means comprising a frame, a turntable rotatable on said frame, a light source connected to said frame adjacent said turntable, at least one elongated lense disposed on said turntable for focusing light coming from said light source into a substantially rectangular crossection light beam having spaced light edges which comprise said spaced apart light boundaries, said turntable further including at least one rectangular mirror disposed opposite said elongated lens for reflecting light coming from said light source toward said elongated lens.

4,217,650
AUTOMATIC SAUSAGE SLICING AND WEIGHING SYSTEM

Fritz Kuchler, Klagenfurt, Austria, assignor to Brain Dust Patents Establishment, Vaduz, Liechtenstein

Filed May 31, 1978, Ser. No. 911,289
Claims priority, application Austria, Jun. 1, 1977, 3858/77
Int. Cl.[2] B26D *4/56;* G01G *19/40*
U.S. Cl. 364—567 15 Claims



1. A slice-measuring and -weighing method comprising the steps of:

supporting a foodstuff to be sliced on a table adjacent a blade;

relatively displacing said table and said blade in a predetermined stroke direction past each other to cut a slice from said foodstuff;

generating an output when said blade engages into and cuts said foodstuff;

continuously monitoring the relative positions of said table and said blade in said stroke direction;

generating a width output corresponding to the relative position of said table and said blade on generation of said output and proportional to the width of the cut slice measured in said stroke direction;

generating a thickness output corresponding to the thickness of said cut slice measured in a direction perpendicular to said stroke direction;

generating a density output corresponding to the weight-/volume density of said foodstuff; and

combining said width and thickness outputs mathematically to form a volume output corresponding to the volume of said cut slice and combining said volume output with said density output to determine the weight of said cut slice.

4,217,651
ELECTRICAL MEASUREMENTS

John R. Pickering, Cawston, England, assignor to Datron Electronics Limited, Norwich, England

Filed Dec. 12, 1978, Ser. No. 968,849
Int. Cl.[2] G01R *13/00*
U.S. Cl. 364—571 28 Claims

17. A measuring device for measuring the value of an input electrical signal comprising:

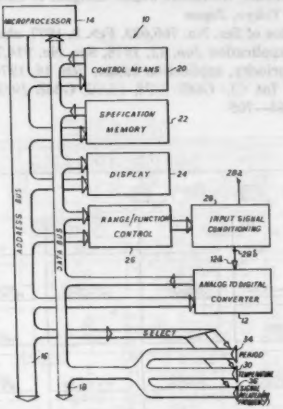
a data processing apparatus for determining the uncertainty value of the measured reading of the input electrical signal, the apparatus comprising:

storage means for storing data values representative of the accuracy specifications of a measuring instrument with which it is to be used,

a calculating apparatus and control means for controlling operation of the calculating apparatus;

a measuring instrument coupled, in use, to the apparatus;

the control means reading out said data values from said storage means into said calculating apparatus, thereby causing the measuring instrument to effect a measurement



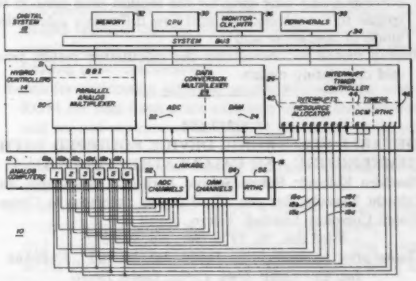
and supply a digital value representative of the measured reading to the calculating apparatus and further causing the calculating apparatus to calculate the said uncertainty value from the data values and the measured value; and

display means and means for selectively displaying the measured value of the input electrical signal and the uncertainty of the measured signal.

4,217,652
MULTI-USER ANALOG/HYBRID SYSTEM

John F. Klaus, Lincroft, and F. James Liotta, Long Branch, both of N.J., assignors to Electronic Associates, Inc., West Long Branch, N.J.

Filed Mar. 1, 1978, Ser. No. 882,329
Int. Cl.[2] G06J *1/00*
U.S. Cl. 364—601 56 Claims



1. An analog/hybrid system for at least two hybrid users comprising

a digital computer having a main digital memory,

a plurality of analog computers running on individual analog programs with at least one of the analog programs becoming time critical,

means for linking flow of data between the analog computers and the digital computer, and

means coupled to said linking means for substantially preempting and allocating said data flow from nontime criti-

cal analog programs to the time critical analog program during ongoing data flow and as available allocating data flow to the nontime critical analog program.

4,217,653

ELECTRONIC APPARATUS FOR TIME CALCULATION

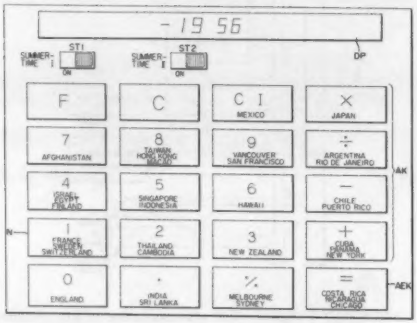
Shinichi Nakata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 766,683, Feb. 8, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,741

Claims priority, application Japan, Feb. 16, 1976, 51-15651

Int. Cl.[2] G06F *7/38, 15/02;* **G04B** *19/22*

U.S. Cl. 364—705 **10 Claims**



1. A calculator comprising:

input means for manually entering numerical information;

instruction means for selectively instructing a first or reference time zone and a second time zone;

mode selecting means for manually selecting between a four function calculation mode and a time difference calculation mode of operation;

calculating means for performing arithmetic operations;

control means for controlling said calculating means to perform a four function calculation with the numerical information from said input means in response to the selection of said four function calculation mode of operation, and for controlling said calculating means to perform a time difference calculation with the numerical information from said input means as time data for the first time zone instructed by said instruction means to convert it into corresponding time data for the second time zone in response to the selection of said time difference calculation mode of operation; and

display means for visualizing the calculation results from said calculating means.

4,217,654

PORTABLE ELECTRONIC DEVICE EQUIPPED WITH TIMEKEEPING AND CALCULATION FUNCTIONS

Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,077

Claims priority, application Japan, Jul. 26, 1977, 52-89668

Int. Cl.[2] G06F *7/48, 15/02;* **G04B** *19/30*

U.S. Cl. 364—705 **4 Claims**

1. An electronic wristwatch calculator equipped with a source of standard frequency time signals, keyboard means for applying input numeric and function data signals for calculation purposes, and means for calculating and displaying time data and calculation data, comprising:

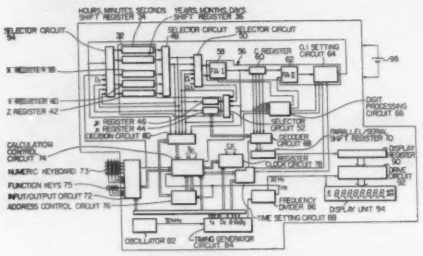
first shift register means for storing and shifting at least seconds, minutes and hours of current time data;

second shift register means for storing and shifting calculation data;

calculation control circuit means responsive to said standard frequency time signals and to said numeric and function data signals for producing a plurality of selector signals, a first plurality of control signals when a normal timekeeping mode of operation is in progress, and a second plurality of control signals when a calculation operation is in progress;

first selector circuit means responsive to said selector signals for selectively passing said current time data from said first shift register means and said calculation data from said second shift register means to an output thereof;

calculation circuit means coupled to receive said current time data and said calculation data from said output of the first selector circuit means, being responsive to said first plurality of control signals for periodically incrementing



said current time data when said normal timekeeping mode of operation is in progress and responsive to said second plurality of control signals for performing a calculation operation on said calculation data when a calculation operation is in progress, and further responsive to the termination of said second plurality of control signals for incrementing said current time data upon the completion of a calculation operation if said calculation operation overlaps in time a point at which said periodic incrementing of said current time data would normally occur; and

second selector means responsive to said selector signals for selectively passing said current time data and said calculation data from an output of said calculation circuit means to said first shift register means and said second shift register means.

4,217,655

CLOCK CIRCUIT HAVING A SWEPT OUTPUT FREQUENCY

Thomas F. Michalski, Maumee, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 17, 1978, Ser. No. 934,445

Int. Cl.[2] H03B *23/00*

U.S. Cl. 364—701 **4 Claims**

1. Apparatus for generating a swept clock frequency having a linear rate of change, comprising:

a counter;

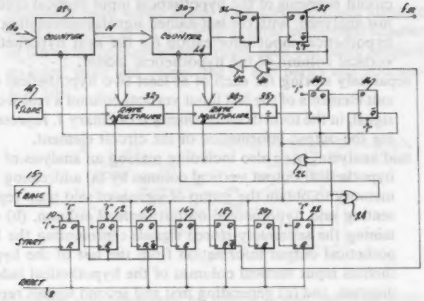
means for clocking said counter comprising:

a first rate multiplier, said first rate multiplier, having an input from said counter;

constant frequency generator means for clocking said first rate multiplier;

a second rate multiplier, said second rate multiplier being

clocked by the output of said first rate multiplier and having an input from said counter; and



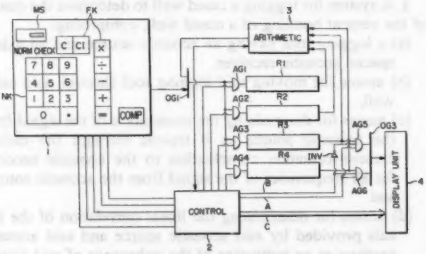
a frequency divider for dividing the output of said second rate multiplier, wherein the output of said frequency divider is utilized to clock said counter.

4,217,656

ELECTRONIC CALCULATOR

Reiji Hirano, Yokohama; Koichi Mochizuki, Tokyo; Tokio Yasui, Tokyo, and Jyoji Shimazu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 704,752, Jul. 12, 1976, abandoned. This application Feb. 21, 1978, Ser. No. 879,506
Int. Cl.² G09B *19/02*
U.S. Cl. 364—710 **12 Claims**



1. Electronic apparatus comprising:

input means for entering numerical data and operational instructions;

memory means for storing the numerical data;

processing means for processing the numerical data stored in said memory means in response to said operational instructions;

display means for providing a visual display of the processed numerical data;

selecting means settable to a first state and a second state such that the display of numerical data processed in said processing means is enabled when said selecting means is in the first state; and

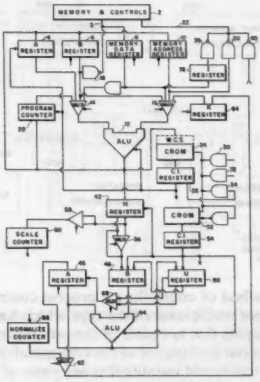
means responsive to the second state of said selecting means for disabling the display of the processed numerical data.

4,217,657

FLOATING POINT ARITHMETIC CONTROL

Robert J. Handly, and Robert H. Douglas, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1978, Ser. No. 952,562
Int. Cl.² G06F *7/48*
U.S. Cl. 364—748 **6 Claims**



1. Computational apparatus for effecting floating point calculations comprising:

a first microprocessor including a first arithmetic logic unit and a first control ROM;

said first control ROM including a first segment having a first number of addressable words for the control of said first microprocessor during fixed point calculations, and a second segment having a second number of addressable words for the control of said first microprocessor during floating point calculations;

means for addressing said first segment of said first control ROM for said fixed point calculations and for addressing said second segment of said ROM for said floating point calculations;

a second microprocessor having a second arithmetic logic unit and a second control ROM;

said second control ROM having a number of addressable control words which corresponds to the number of control words in said second segment of said first control ROM for the control of said second microprocessor during said floating point calculations; and

means for addressing said second control ROM coincidently with the addressing of said second segment of said first control ROM;

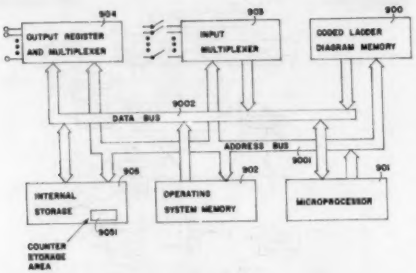
interconnection means between said first and second microprocessor so interconnecting said first and second microprocessors that a first portion of said values being manipulated in a floating point calculation are manipulated by said first microprocessor simultaneously with the manipulation of a second portion of said values by said second microprocessor.

4,217,658

PROCESS CONTROL SYSTEM THAT CONTROLS ITS OUTPUTS ACCORDING TO THE RESULTS OF SUCCESSIVE ANALYSIS OF THE VERTICAL INPUT COLUMNS OF A HYPOTHETICAL LADDER DIAGRAM

Donald E. Henry, Bettendorf, Iowa; Thomas A. Murrell, Urbana, Ill.; Marvin H. Schilt, Bettendorf, Iowa, and Alfred C. Weaver, Champaign, Ill., assignors to Struthers-Dunn, Inc., Pitman, N.J.

Filed Jul. 25, 1977, Ser. No. 819,038
Int. Cl.[2] G06F *15/46*
U.S. Cl. 364—900 11 Claims



1. The method of controlling a process control system that has (i) an input multiplexer of the type which has a plurality of real world inputs that are parts of the process to be controlled and (ii) an output multiplexer of the type which has at least first and second real world outputs that are parts of the process to be controlled, said process control system including a data processor including a memory, comprising:

the step of generating a train of pulses representing a hypothetical ladder diagram which diagram comprises a plurality of hypothetical input vertical columns of hypothetical circuit elements at least some of said hypothetical circuit elements respectively being the hypothetical counterparts of at least some of said real world inputs, and a hypothetical output vertical column of hypothetical circuit elements following the input vertical columns, at least some of the hypothetical circuit elements of the hypothetical vertical column respectively being the hypothetical counterparts of real world outputs,

said step of generating a train of pulses comprising generating the pulses in a predetermined order, and in groups, with each group representing one hypothetical vertical column, with the groups occurring in the same sequence that the hypothetical vertical columns appear in the hypothetical ladder diagram, and with the group representing the hypothetical output vertical column occurring after the groups representing the hypothetical input vertical columns have all occurred,

storing said train of pulses in a memory and transmitting the various groups to particular addresses, respectively, in the memory,

analyzing the hypothetical input vertical columns comprising addressing the memory in a given sequence to analyze the hypothetical input vertical columns one at a time and in the same sequence as such hypothetical vertical columns occur in the hypothetical ladder diagram, the analysis of each hypothetical input vertical column including the acts of (a) addressing the memory to obtain signals representing the pulses of said train representing the hypothetical vertical column under analysis, (b) addressing the input multiplexer to obtain input information in the form of signals respecting the real world inputs which are counterparts of hypothetical circuit elements of the hypothetical vertical column under analysis, (c) obtaining signals representing hypothetical potentials at the hypothetical inputs of the hypothetical circuit elements of the hypothetical vertical column under analysis, and (d) utilizing the signals obtained by reason of the immediately preceding steps (a), (b), and (c) to produce signals representing the hypothetical output conditions of the hypothetical circuit elements of the hypothetical input vertical column just analyzed; with the last-named signals representing the hypothetical input information for the next hypothetical vertical column of the hypothetical ladder,

separately storing for each of at least two hypothetical circuit elements of the last input vertical column a real world signal, in the form of either binary **0** or binary **1**, representing the output information of the circuit element,

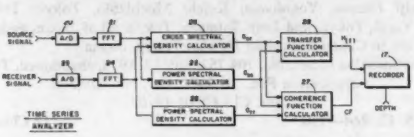
said analyzing step also including making an analysis of the hypothetical output vertical column by (a) addressing the memory to obtain the group of signals of said train representing said hypothetical output vertical column, (b) obtaining the separately stored signals representing the hypothetical output information from the last of the hypothetical input vertical columns of the hypothetical ladder diagram, and (c) generating first and second signals representing the desired condition of at least first and second of said real world outputs, and separately storing said first and second signals, such that first and second separate circuit elements of the hypothetical output vertical column separately and independently control via the output multiplexer said first and second real world outputs.

4,217,659

ACOUSTIC LOGGING FOR EXAMINATION OF THE CEMENT BONDING OF WELL CASING

Edwin E. Glenn, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,716
Int. Cl.[2] G01V *1/40, 1/30*
U.S. Cl. 367—35 3 Claims



1. A system for logging a cased well to determine the quality of the cement bonding of a cased well, comprising:

(a) a logging tool having an acoustic source and an axially spaced acoustic receiver,

(b) means for moving said logging tool through said cased well,

(c) means for determining the attenuation of the signal from the acoustic source as it travels through the casing-cement-formation combination to the acoustic receiver for all frequencies of the signal from the acoustic source, and

(d) means for determining the linear correlation of the signals provided by said acoustic source and said acoustic receiver as an indication of the coherence of said signals for all frequencies of the signal provided by the acoustic source.

4,217,660

METHOD AND APPARATUS FOR THE CODING AND DECODING OF DIGITAL DATA

John En, San Diego, Calif., assignor to Motorola, Inc., Schaumburg, Ill.

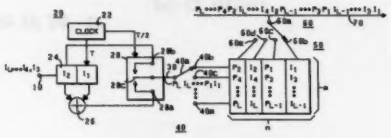
Filed Jul. 17, 1978, Ser. No. 925,348
Int. Cl.[3] G06F *11/10*
U.S. Cl. 371—44 10 Claims

1. A method for encoding an information bit stream of L bits, $I_1 \ldots I_L$ and comprising the steps of:

(a) convolutionally encoding said bit stream by generating parity bits P_i, where i is a integer from **1** to L and convolv-

ing the information and parity bits in a predetermined sequence;

(b) providing a storage matrix having m columns and n rows of storage cells, where m and n are predetermined integers whose product $m \times n$ is at least as great as the total number of bits in the convolved bit stream, each cell being adapted to input, store and output one of said parity and information bits;



(c) storing said convolved bit stream in said matrix in accordance with a predetermined row by row sequence;

(d) outputting said stored bit stream from said matrix in accordance with a predetermined column by column sequence such that the encoded bit stream is of the form $P_L \ldots P_4P_2I_1 \ldots I_4I_2P_{L-1} \ldots P_3P_1I_{L-1} \ldots I_3I_1$.

4,217,661

AUDIO SIGNAL TRANSMISSION SYSTEM AND METHOD INCORPORATING AUTOMATIC FREQUENCY CORRECTION

Leonard R. Kahn, 137 E. 36th St., New York, N.Y. 10016

Filed Oct. 14, 1975, Ser. No. 621,669

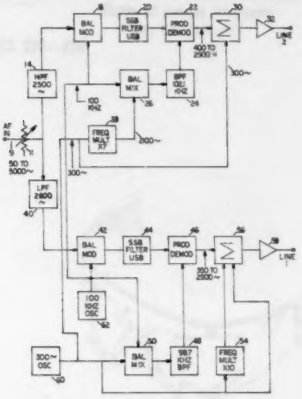
Int. Cl.[2] H04B *1/68*

U.S. Cl. 455—59 **10 Claims**

10. A method for transmitting and receiving a relatively wideband signal without introducing frequency holes over two or more relatively narrow band channels comprising:

(a) Segmenting and processing the wideband signal into frequency segments which include overlap frequency components,

(b) Transmitting said segments over narrow band channels,

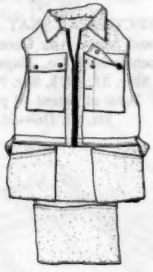


(c) receiving and controlling the phase of at least some of the received segments so that at least a substantial portion of the overlap components are properly phased, and,

(d) processing and combining the narrow band segments at the receive end of the system so that the overall frequency response including overlap frequencies is relatively constant over the passband of the system.

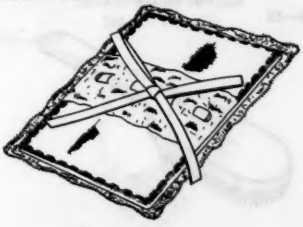
256,288
BRASSIERE
Harold Stern, Wyckoff, and Phyllis Raimondi, Glen Rock, both of N.J., assignors to International Playtex, Inc., Stamford, Conn.
Filed Jun. 13, 1977, Ser. No. 806,022
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

256,289
WORKMAN'S VEST
Matti Viio, Box 563, 191 05 Sollentuna, Sweden
Filed May 2, 1978, Ser. No. 902,155
Claims priority, application Sweden, Nov. 2, 1977, 772225
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—190

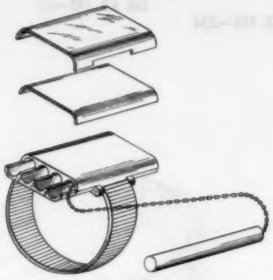


256,290
SPORT GOGGLES
Ray L. Solari, 1670 Cordova St., Los Angeles, Calif. 90007
Filed Jul. 17, 1978, Ser. No. 925,444
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

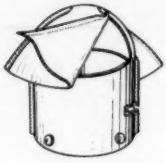
256,291
CAKE MITT
Lynn McLelland, 909 Linda Dr., Hattiesburg, Miss. 39401
Filed Nov. 8, 1977, Ser. No. 849,587
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—364



256,292
WRIST BAND PEN HOLDER
Morris E. Cox, P.O. Box 8743, Jackson, Miss. 39204
Filed Jul. 24, 1978, Ser. No. 736,497
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—402

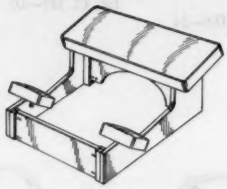


256,293
RAIN COVER FOR A GOLF BAG
Harry M. Edwards, 622 Lillian Way, Los Angeles, Calif. 90007
Filed Jan. 23, 1978, Ser. No. 871,468
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—37

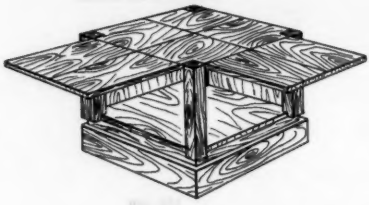


256,294
HAIR BRUSH
Kim U. Su, 126-12 Yon Hee Dong, Se Dae Mun Ku, Seoul, Rep. of Korea
Filed Jul. 17, 1978, Ser. No. 925,315
Claims priority, application Rep. of Korea, Mar. 16, 1978, 78-1114
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

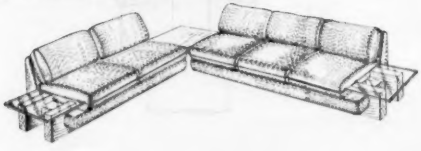
256,295
BENCH FOR USE IN MEDITATION
David R. Hay, 31755 Coast Hwy., Apt. 208, S. Laguna Beach, Calif. 92677
Filed May 15, 1978, Ser. No. 906,135
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—2



256,296
CONVERTIBLE TABLE
Lester Beall, P.O. Box 683, High Point, N.C. 27261
Filed Dec. 6, 1977, Ser. No. 858,285
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—40

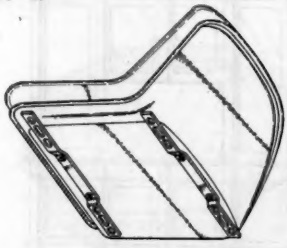


256,297
COMBINED SECTIONAL SEAT AND TABLE UNIT
Robert A. Gera, and Mary Ann Gera, both of Glencoe, Ill., assignors to Kroehler Mfg. Co., Naperville, Ill.
Filed Mar. 31, 1978, Ser. No. 893,144
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—46



256,298
SEAT FOR TRANSPORTATION VEHICLES
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed Jun. 26, 1978, Ser. No. 919,371
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

256,299
VEHICLE SEAT
Willis MacCready, Jackson, Mich., assignor to Michigan Seat Company, Jackson, Mich.
Filed Oct. 16, 1978, Ser. No. 951,677
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48



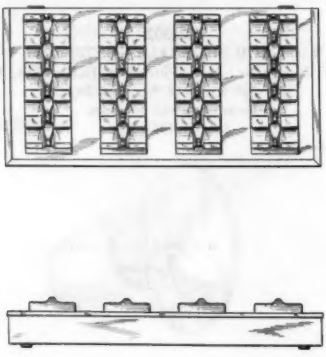
256,300
CHAIR
Junzo Yoshimura, 8-6 Mejiro 3-chome, Toshima-ku, Tokyo, Japan
Filed Sep. 11, 1978, Ser. No. 941,268
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

256,301
MOVABLE SHELF DIVIDER
Patrick Cutts, 842 Sea-Aira Heights, R.R. 7, Victoria, British Columbia, Canada
Filed Aug. 22, 1978, Ser. No. 936,581
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85

256,302
RACK FOR FOOTBALL EQUIPMENT
William W. Moore, Sr., 3474 Whirlaway, Dallas, Tex. 75229
Filed Jul. 12, 1979, Ser. No. 56,825
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114

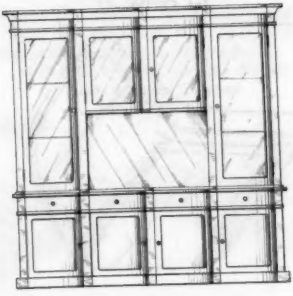
256,303
CADDY FOR ASSEMBLED RODS AND REELS
Paul F. Rieman, 4390 E. Broadway, Des Moines, Iowa 50317
Filed Aug. 31, 1978, Ser. No. 938,983
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125

256,304
DISPLAY DEVICE FOR SPECTACLES
Arthur A. Marx, 271 Madison Ave., New York, N.Y. 10016
Filed Apr. 11, 1979, Ser. No. 29,115
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157

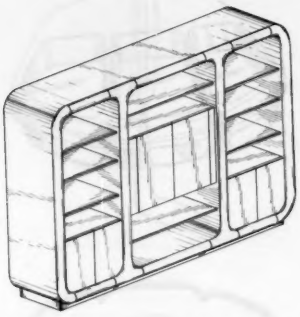


256,305
COLLAPSIBLE DRAWER UNIT
Jerry L. Johnson, Portrero, Calif., assignor to Landes Manufacturing Company, Los Angeles, Calif.
Filed Jun. 14, 1978, Ser. No. 915,197
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—165

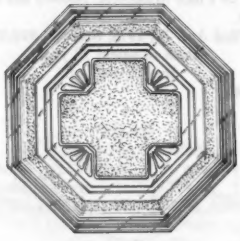
256,306
BREAKFRONT OR SIMILAR ARTICLE
Andrew Miklos, 61 Elm St., Englewood Cliffs, N.J. 07632
Filed Jan. 23, 1978, Ser. No. 871,526
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—172

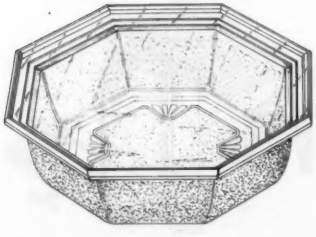


256,307
WALL UNIT
Edith Frank, 166-25 Powells Cove Blvd., Beechhurst, N.Y. 11357
Filed Apr. 3, 1978, Ser. No. 893,150
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

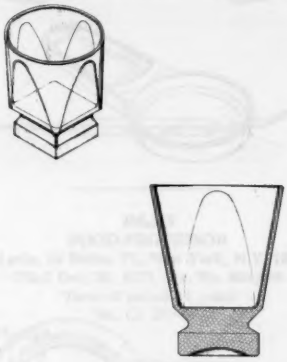


256,308
DEEP DISH PLATE
Joerg Zimmermann, Uhingen, Fed. Rep. of Germany, assignor to Wurtenbergische Metallwaren Fabrik, Fed. Rep. of Germany
Filed Mar. 27, 1978, Ser. No. 890,840
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—1



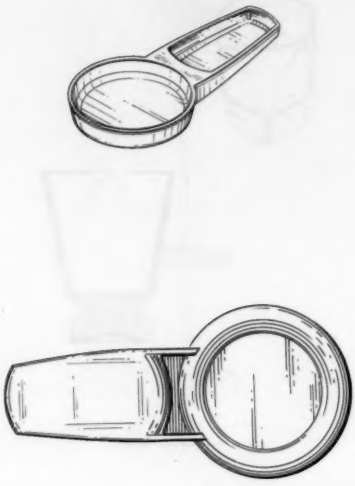


256,309
BEVERAGE TUMBLER
Jon R. Saffell, Glen Dale, W. Va., assignor to Fostoria Glass Company, Moundsville, W. Va.
Filed Feb. 13, 1978, Ser. No. 877,529
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—11

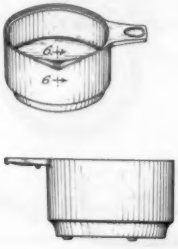


256,310
COMBINED FOOD STORAGE AND SERVING CUP OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 23, 1977, Ser. No. 863,767
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—23

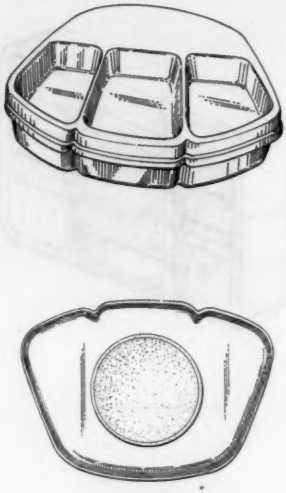
256,311
MEASURING SPOON OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, Belgium, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 20, 1978, Ser. No. 871,059
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—50



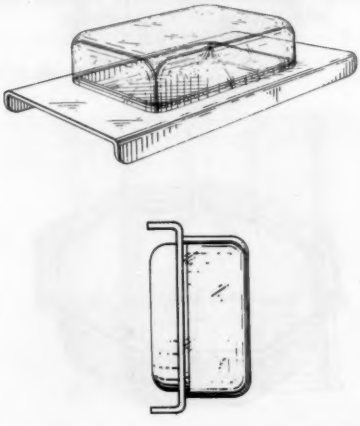
256,312
COMBINED COOKING AND HEATING VESSEL
Robert O. Ernest, Oak Park, and Norman A. Steinkamp, La Grange Park, both of Ill., assignors to Sunbeam Corporation
Filed Jul. 17, 1978, Ser. No. 925,019
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—64



256,313
ELECTRICALLY HEATED BABY FOOD DISH
David Chapman, Chicago, Ill., assignor to Gerbert Products Company, Fremont, Mich.
Filed May 1, 1978, Ser. No. 901,651
Term of patent 14 years
Int. Cl. D07—*01, 02*
U.S. Cl. D7—69



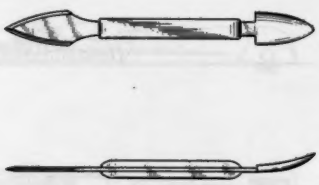
256,314
COMBINED BUTTER TRAY AND COVER
Andre Morin, 59 Place Mansfield, Dollard des Ormeaux, Quebec, Canada
Filed Apr. 20, 1978, Ser. No. 898,504
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—84



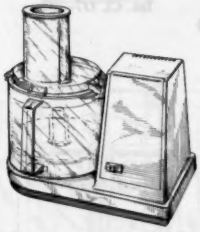
256,315
BOILED-EGG DIPPER
John H. Eskew, Jr., 516 St. Paul Dr., Cahokia, Ill. 62206
Filed Feb. 15, 1979, Ser. No. 12,573
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—103

256,316
FOLDAWAY GRILL
Robert M. Nichols, Jr., Buffalo, N.Y., assignor to Great Lakes Pressed Steel Corporation, Buffalo, N.Y.
Filed Dec. 12, 1977, Ser. No. 859,655
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—107

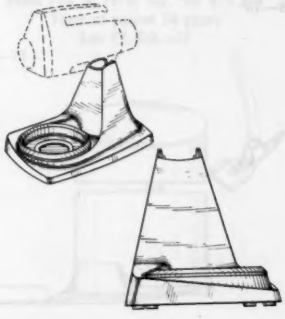
256,317
KNIFE FOR FILLETING FISH
Daniel M. Marquart, Sr., R.F.D. 3, Albion, N.Y. 14411
Filed Aug. 31, 1978, Ser. No. 938,515
Term of patent 14 years
Int. Cl. D07—*03;* D08—*03*
U.S. Cl. D7—149



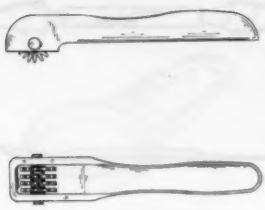
256,318
FOOD PROCESSOR
Monte L. Levin, 16 Sutton Pl., New York, N.Y. 10022
Filed Dec. 30, 1977, Ser. No. 866,468
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—154



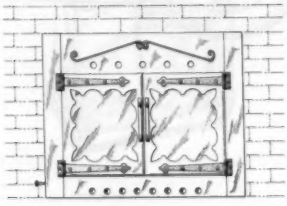
256,319
STAND FOR A MIXER
Robert O. Ernest, Oak Park; Richard K. Thomas, Elk Grove Village, and Gordon T. Guth, Evanston, all of Ill., assignors to Sunbeam Corporation
Filed Jul. 14, 1978, Ser. No. 924,593
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—160



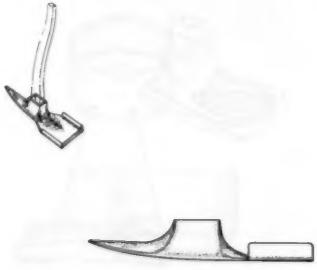
256,320
CLEANING TOOL FOR REMOVING PAINT OR THE LIKE FROM GRINDER DISKS
William J. Meis, 6 Valley Dr., Crescent, Iowa 51526
Filed Oct. 10, 1978, Ser. No. 949,727
Term of patent 14 years
Int. Cl. D07—*05*
U.S. Cl. D7—185



256,321
FIREPLACE SCREEN
Anthony Mancarella, Peters La., Rockfall, Conn. 06481
Continuation-in-part of Ser. No. 771,900, Feb. 25, 1977, Pat. No. Des. 248,443. This application Dec. 22, 1977, Ser. No. 863,340
The portion of the term of this patent subsequent to Jul. 11, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—208



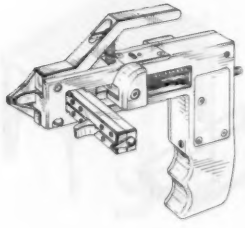
256,322
EARTH DIGGING AND TRENCHING TOOL HEAD
Ron Zabarte, 1757 Tice Valley Blvd., Walnut Creek, Calif. 94595
Filed Mar. 2, 1978, Ser. No. 883,038
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10



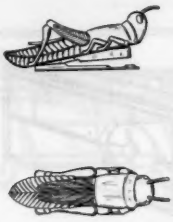
256,323
CAP REMOVER
Donald R. Obland, 6750 S. Clermont St., Littleton, Colo. 80122
Filed Apr. 10, 1978, Ser. No. 895,287
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—18

256,324
TWIN HEADED BOX WRENCH
Wayne E. Coffey, R.D. 2, Box 211, Clifton Springs, N.Y. 14432
Filed Apr. 4, 1978, Ser. No. 893,492
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—28

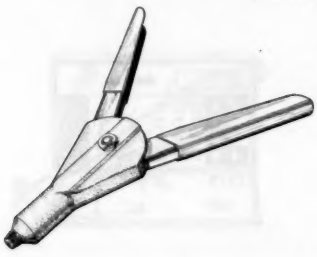
256,325
HAND HELD WELDING TOOL
Basil D. Crooks, and R. Brian P. Bennett, both of Toronto, Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Jun. 17, 1977, Ser. No. 807,491
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



256,326
STAPLER
William O. Murtagh, Toledo, Ohio, assignor to Gerity Products, Incorporated, Toledo, Ohio
Filed Aug. 14, 1978, Ser. No. 933,725
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D8—50

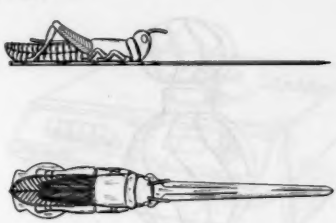


256,327
RIVETER
John F. Ewig, Jr., Worcester, and Jon S. Gardner, Marlboro, both of Mass., assignors to Parker Manufacturing Company, Worcester, Mass.
Filed Apr. 4, 1978, Ser. No. 893,459
Term of patent 14 years
Int. Cl. D08—*02*
U.S. Cl. D8—51

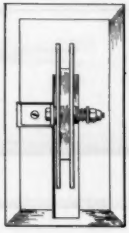


256,328
PORTABLE MOUNTING STAND FOR AMMUNITION HANDLOADING PRESS
Sidney W. Johnson, Rte. 5, Box 408, L-52, Nacogdoches, Tex. 75961
Filed Mar. 27, 1978, Ser. No. 890,698
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

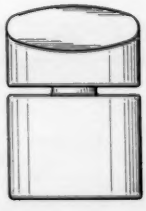
256,329
LETTER OPENER
William O. Murtagh, Toledo, Ohio, assignor to Gerity Products, Incorporated, Toledo, Ohio
Filed Aug. 14, 1978, Ser. No. 933,655
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—103



256,330
FOIL DISPENSER
Marty J. Becker, 3531 E. Blacklidge, Tucson, Ariz. 85716
Filed Nov. 21, 1977, Ser. No. 853,635
Term of patent 7 years
Int. Cl. D8—*99*
U.S. Cl. D8—358

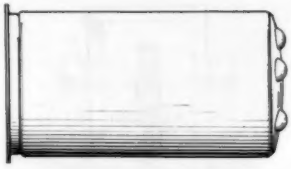


256,331
BOTTLE
Joanne L. Gindek, and Joseph R. Messina, both of New York, N.Y., assignors to Revlon, Inc., New York, N.Y.
Filed Feb. 6, 1978, Ser. No. 875,399
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



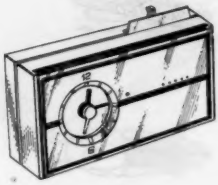
256,332
BOTTLE
Joseph R. Messina, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Feb. 7, 1978, Ser. No. 875,938
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—145

256,333
BEVERAGE CONTAINER
Arlin L. Campbell, and Roger B. Cannon, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.
Filed Aug. 17, 1977, Ser. No. 825,465
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

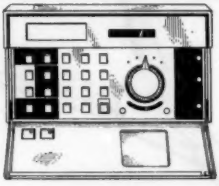


256,334
BOX
Alwin J. Stahel, II, New Brighton, Minn., assignor to Princeton Industries Corporation, Princeton, Ind.
Filed Jan. 17, 1978, Ser. No. 870,058
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237

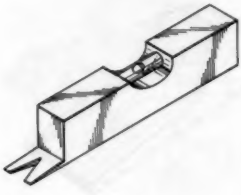
256,335
CLOCK THERMOSTAT
Ralph E. Pasquarette, Jordan, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 27, 1978, Ser. No. 881,488
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



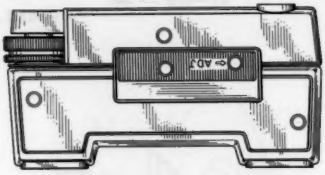
256,336
CLOCK THERMOSTAT
James A. Odom, Apple Valley; Ralph E. Pasquarette, Jordan, and Norbert T. Wolfe, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 27, 1978, Ser. No. 881,487
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—51



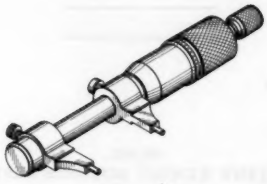
256,337
LEVEL
Gene Derryberry, and Thornton E. Cory, both of P.O. Box 9950, Houston, Tex. 77015
Filed Sep. 25, 1978, Ser. No. 945,567
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69



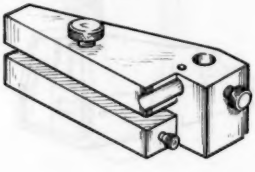
256,338
RANGE FINDER
Charles E. Kester, Fairport, and Thomas E. Hughes, Palmyra, both of N.Y., assignors to Ranging, Inc.
Filed Sep. 28, 1978, Ser. No. 946,836
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70



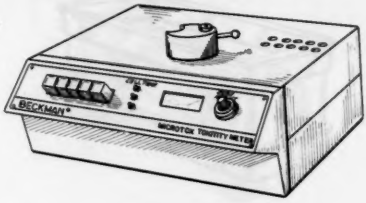
256,339
MICROMETER
Tadashi Konishi, Hiroshima, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan
Filed Sep. 19, 1978, Ser. No. 943,736
Claims priority, application Japan, Mar. 22, 1978, 53/010526
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



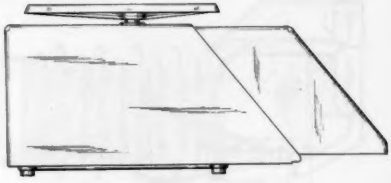
256,340
ATTACHMENT TOOL FOR A STRAIGHT EDGE OR TAPE MEASURE FOR MARKING OR FACILITATING THE MARKING OF STRAIGHT OR ARCUATE LINES
Daniel M. Spohn, Jr., 8451 Miller Rd., Swartz Creek, Mich. 48473
Filed Sep. 19, 1977, Ser. No. 834,832
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74



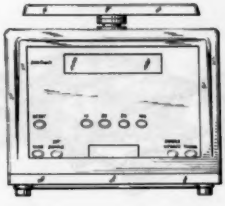
256,341
PHOTOMETER
Otto Haunold, Carlsbad, and Edgar H. Frank, Anaheim, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.
Filed Jun. 26, 1978, Ser. No. 918,890
Term of patent 14 years
Int. Cl. D24—*02;* D10—*04*
U.S. Cl. D10—81



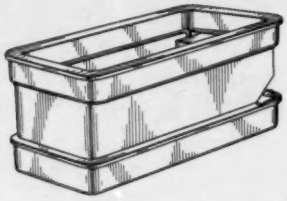
256,342
COUNTING SCALE
Eric A. Gard, Lancaster, Pa., assignor to Pennsylvania Scale Company, Leola, Pa.
Filed Sep. 11, 1978, Ser. No. 940,947
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



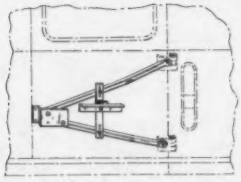
256,343
COUNTING SCALE
Eric A. Gard, Lancaster, Pa., assignor to Pennsylvania Scale Company, Leola, Pa.
Filed Sep. 11, 1978, Ser. No. 940,960
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—91



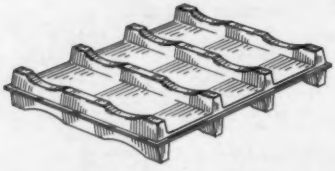
256,344
HYDROPONIC UNIT
Stuart B. Schneck, 766 Teresita Blvd., San Francisco, Calif. 94127
Filed May 25, 1978, Ser. No. 909,711
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—156



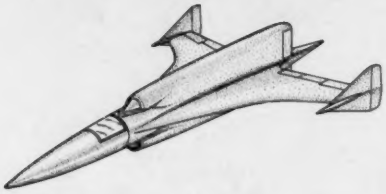
256,345
TIRE CARRIER FOR A VAN TYPE VEHICLE
Raywood C. Weiler, Fontana, Calif., assignor to Blackstone Manufacturing Co., Inc., Chicago, Ill.
Filed Jun. 4, 1979, Ser. No. 45,518
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—202



256,346
BEER KEG PALLET
James M. Annis, R.F.D. #3 Rte. 11, Laconia, N.H. 03246
Filed Aug. 21, 1978, Ser. No. 935,748
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D12—53

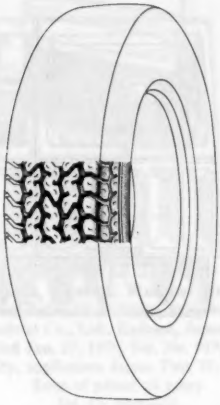


256,347
AIRCRAFT
Jean McComas, West Islip, N.Y., assignor to Fairchild Industries, Inc., Germantown, Md.
Filed May 26, 1977, Ser. No. 800,821
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—71



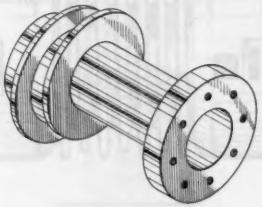
256,348
PANEL TRUCK BODY
Donald W. Galloway, 1140 Sunrise Hill, Concord, Calif. 94518
Filed Aug. 7, 1978, Ser. No. 931,802
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—96

256,349
TIRE
Jean F. L. Fontaine, Ingeldorf; Leon J. Hitzky, Bonneweg, and Jan E. Jablonski, Kirchberg, all of Luxembourg, assignors to The Goodyear Tire & Rubber Company
Filed Dec. 15, 1978, Ser. No. 970,026
Claims priority, application United Kingdom, Jun. 20, 1978, 985114/78
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

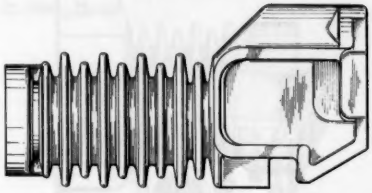


256,350
TRIM RING FOR VEHICLE WHEEL
John A. Main, Plymouth, Mich., assignor to Kelsey Hayes Co, Romulus, Mich.
Filed Feb. 21, 1978, Ser. No. 879,661
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

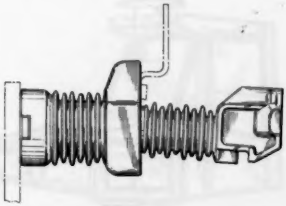
256,351
SOLENOID CYLINDER FRAME FOR RECIPROCATING MOTOR
Everett E. Schulze, 1357 Helena, Apt. 100, Aurora, Colo. 80011
Filed Jan. 3, 1978, Ser. No. 866,530
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



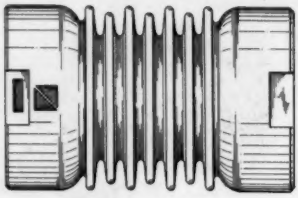
256,352
HOUSING FOR ELECTRICAL APPARATUS
David M. Evans, Palatine, Ill., assignor to S&C Electric Company, Chicago, Ill.
Filed May 1, 1978, Ser. No. 901,965
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11



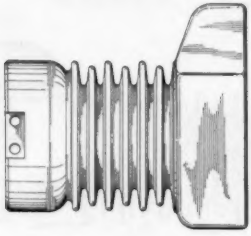
256,353
BASE-MOUNTED HIGH VOLTAGE CIRCUIT INTERRUPTER
David M. Evans, Palatine, Ill., assignor to S&C Electric Company, Chicago, Ill.
Filed May 1, 1978, Ser. No. 901,968
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—11



256,354
MOLDED ELECTRICAL INSULATOR
Joel A. Ramos, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.
Filed May 1, 1978, Ser. No. 901,964
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

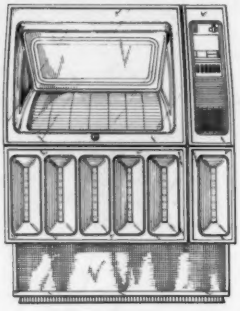


256,355
MOLDED INSULATING BASE FOR AN ELECTRICAL APPARATUS
David M. Evans, Palatine, and Joel A. Ramos, Chicago, both of Ill., assignors to S&C Electric Company, Chicago, Ill.
Filed May 1, 1978, Ser. No. 901,966
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17



256,356
ELECTRICAL PLUG SEALER
Jay A. Lazerson, 33 Townhouse Manor, Sedalia, Mo. 65301
Filed Sep. 22, 1978, Ser. No. 944,873
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—99

256,357
PHONOGRAPH
Melvin H. Boldt, Glenview, Ill., assignor to Rowe International, Inc., Whippany, N.J.
Filed Nov. 1, 1977, Ser. No. 847,690
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—15



256,358
PHONOGRAPH CABINET
David R. Wilcox, Burton-on-Trent, England, assignor to Associated Leisure Games Limited
Filed Jul. 17, 1978, Ser. No. 925,305
Claims priority, application United Kingdom, Jan. 19, 1978, 983017/78
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—15

256,359
PORTABLE RADIO

Shuhei Taguchi, Hirakata, and Takao Okada, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 15, 1978, Ser. No. 915,853
Claims priority, application Japan, Dec. 16, 1977, 52-49809
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

256,360
SOLAR BATTERY POWERED RADIO RECEIVER

Teruyuki Nishimoto, Hirakata; Masanori Hamada, Yao, and Benito Mishiro, Sakai,all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 27, 1978, Ser. No. 919,875
Claims priority, application Japan, Dec. 27, 1977, 52-52651
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

256,361
RADIO RECEIVER

Benito Mishiro, Sakai; Teruyuki Nishimoto, Hirakata; Shinzo Murakami, Osaka, and Takeyoshi Kawano, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 27, 1978, Ser. No. 919,877
Claims priority, application Japan, Dec. 27, 1977, 52-52642
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

256,362
RADIO RECEIVER

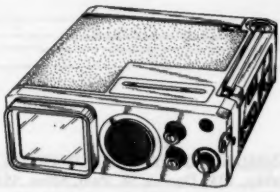
Shuhei Taguchi; Teruyuki Nishimoto, both of Hirakata; Masanori Hamada, Yao; Benito Mishiro, Sakai, and Kikuo Ohta, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 27, 1978, Ser. No. 919,878
Claims priority, application Japan, Dec. 27, 1977, 52-52644
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

256,363
COMBINED RADIO AND TELEVISION RECEIVER

Rikio Uchiyama, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

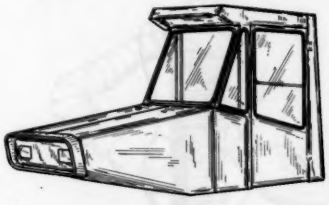
Filed Jul. 6, 1978, Ser. No. 922,465
Claims priority, application Japan, Jan. 9, 1978, 53-290
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—72



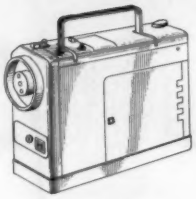
256,364
COMBINED TRACTOR CAB AND HOOD UNIT

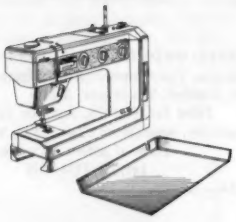
Patrick Kuhn, Bismarck, N. Dak., assignor to Clark Equipment Company, Buchanan, Mich.

Filed May 31, 1978, Ser. No. 911,245
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—30



256,365
SEWING MACHINE
Marcel Fresard, Geneva, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland
Filed Oct. 26, 1977, Ser. No. 845,570
Claims priority, application Switzerland, May 13, 1977, 109210/77
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—70





256,366
SYNTHESIZER OR SIMILAR ARTICLE
Alan L. Dworsky, 1037 Davern, St. Paul, Minn. 55116
Filed Jul. 10, 1978, Ser. No. 922,835
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D17—1

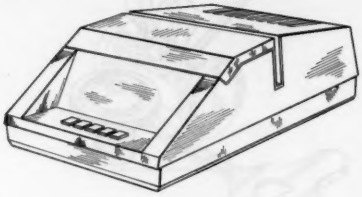
256,367
GUITAR OR SIMILAR ARTICLE
Bruce J. Bolen, Lansing, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.
Filed May 26, 1978, Ser. No. 909,998
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

256,368
GUITAR OR SIMILAR ARTICLE
Bruce J. Bolen, Lansing, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.
Filed May 26, 1978, Ser. No. 910,130
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

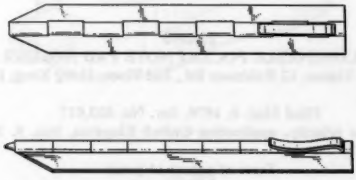
256,369
VIOLIN
Russell B. Leach, 6927 Trenton-Franklin Rd., Middletown, Ohio 45042
Filed Jun. 1, 1977, Ser. No. 802,520
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—17

256,370
CASE FOR HAND-HELD ELECTRONIC CALCULATOR
Shinpei Ichikawa, and Robert A. Welch, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jul. 12, 1978, Ser. No. 923,859
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

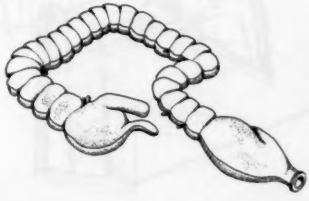
256,371
VALIDATOR PRINTER HOUSING
John Coppola, Trumbull, and William A. Ottersen, Norwalk, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Sep. 18, 1978, Ser. No. 943,609
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D18—13



256,372
WRITING INSTRUMENT
David Y. Chu, Flat 14A Twinbrook, 43 Repulse Bay Rd., Hong Kong, Hong Kong
Filed Sep. 18, 1978, Ser. No. 943,467
Claims priority, application United Kingdom, Apr. 21, 1978, 15888/78; Jun. 1, 1978, 984891/78
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—42



256,373
COLON MODEL
Gerald Marks, 45 Fairview Rd., Narberth, Pa. 19072
Filed Dec. 2, 1977, Ser. No. 857,050
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—62



256,374

PAPER BINDING

Eugene Gerber, 12 Hampton Ct., Lake Success, N.Y. 11020, and Sol Zaret, 11 Cedar La. North, Glen Head, N.Y. 11545

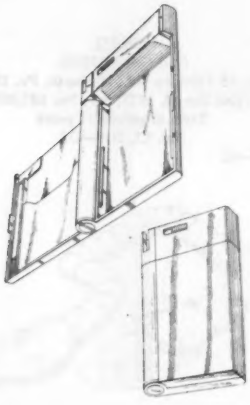
Filed Mar. 22, 1979, Ser. No. 22,849
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—65

256,375

ILLUMINABLE POCKET NOTE PAD HOLDER

Leon A. Llanos, 62 Robinson Rd., 2nd Floor, Hong Kong, Hong Kong

Filed Mar. 6, 1978, Ser. No. 883,617
Claims priority, application United Kingdom, Sep. 9, 1977, 981463/77
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—75

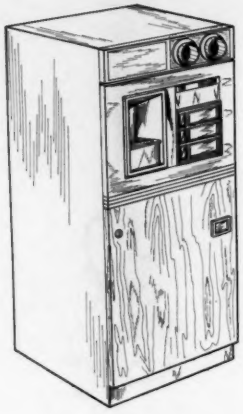


256,376

BEVERAGE DISPENSING MACHINE

William B. MacKrell, New Brighton, Minn., assignor to The Cornelius Company, Anoka, Minn.

Filed Feb. 14, 1978, Ser. No. 877,622
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—4

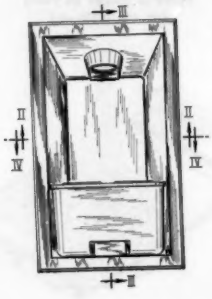


256,377

CUP FILLING COMPARTMENT FOR A BEVERAGE DISPENSING MACHINE

William B. MacKrell, New Brighton, Minn., assignor to The Cornelius Company, Anoka, Minn.

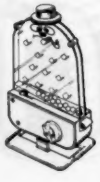
Filed Feb. 14, 1978, Ser. No. 877,623
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—8



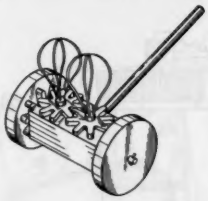
256,378
TOY PIN-BALL MACHINE
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-Ku, Tokyo, Japan
Filed Jul. 31, 1978, Ser. No. 929,317
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12

256,379
TOY PIN-BALL MACHINE
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-ku, Tokyo, Japan
Filed Jul. 31, 1978, Ser. No. 929,318
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12

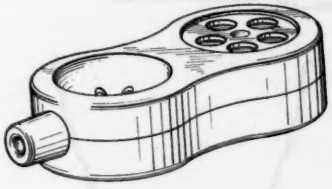
256,380
TOY PIN-BALL MACHINE
Shigeru Saitoh, No. 6-4, 2-chome, Kuramae, Taito-Ku, Tokyo, Japan
Filed Jul. 31, 1977, Ser. No. 929,319
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12



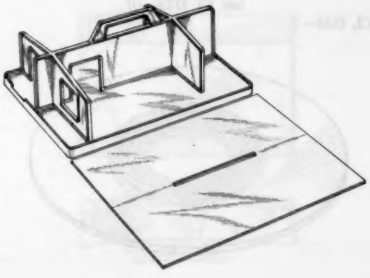
256,381
SPINNING PUSH TOY
Katherine L. Harwood, Airport Bldg. 144, Pasco, Wash. 99301
Filed Dec. 5, 1977, Ser. No. 857,873
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64



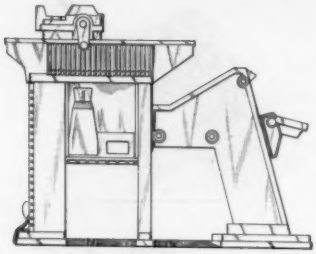
256,382
COMBINED WHISTLE, DIAL AND RATTLE
Shinroku Nakao, Yokohama, and Yoshiyasu Ishii, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Nov. 1, 1977, Ser. No. 847,523
Claims priority, application Japan, Jul. 12, 1977, 52-27273
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65



256,383
TOY SCHOOL BUILDING
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,846
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—114

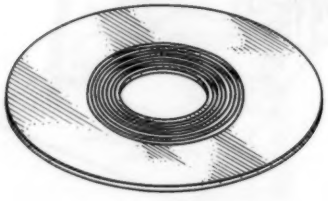


256,384
TOY SERVICE BUILDING
Victor J. Fratarcangeli, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 10, 1978, Ser. No. 868,276
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—118

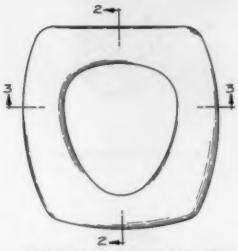


256,385
JUMP ROPE
Robert Fields, 279 Wentworth, Glencoe, Ill. 60022
Filed Mar. 24, 1978, Ser. No. 889,825
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

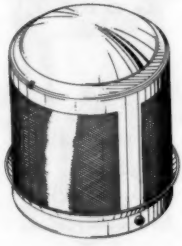
256,386
SPRINKLER SHIELD
Harry G. Bergland, 3812 Floral Dr., North Highlands, Calif. 95660
Filed Feb. 9, 1979, Ser. No. 10,697
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



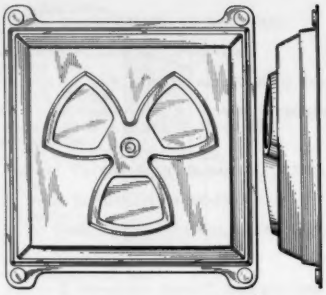
256,387
TOILET SEAT
Elvert H. Land, Jr., 16205 E. Pawnee, Wichita, Kans. 67230
Filed Jul. 8, 1977, Ser. No. 814,110
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



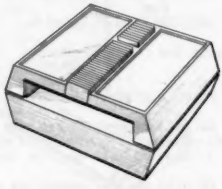
256,388
CYLINDRICAL EVAPORATIVE COOLER
Robert L. Harrell, 1101 W. Southern, Phoenix, Ariz. 85009
Filed Sep. 25, 1978, Ser. No. 945,465
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139



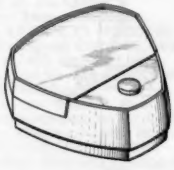
256,389
SELF-CLOSING EXHAUST FAN COVER
Merwin A. Caine, W. County Line Rd., R.D. #1, Jackson, N.J. 08527
Filed Apr. 14, 1978, Ser. No. 896,546
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—151



256,390
CONTACT LENS STERILIZER UNIT
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Jun. 9, 1978, Ser. No. 914,020
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9

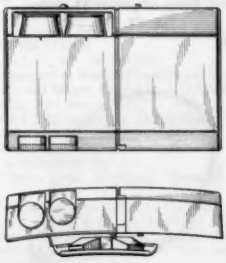


256,391
CONTACT LENS STERILIZER UNIT
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Jun. 21, 1978, Ser. No. 918,312
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9

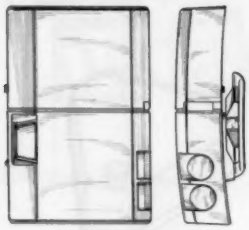


256,392
CONTACT LENS STERILIZER UNIT
Michael D. Thomas, Arab, Ala., and Francis E. Ryder, Barrington, Ill., assignors to Ryder International Corporation, Arab, Ala.
Filed Jun. 21, 1978, Ser. No. 921,125
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—9

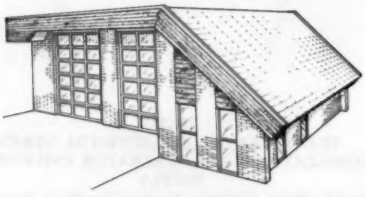
256,393
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR PULSE GENERATOR AND POWER SUPPLY
Richard L. Walus, Columbia Heights; Ronald N. Kannas, and Michael H. Cave, both of Minneapolis, all of Minn., assignors to Stimtech, Inc., Minneapolis, Minn.
Filed Jun. 21, 1978, Ser. No. 917,711
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41



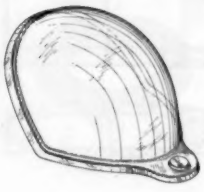
256,394
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATOR PULSE GENERATOR AND POWER SUPPLY
Richard L. Walus, Columbia Heights; Ronald N. Kannas, and Michael H. Cave, both of Minneapolis, all of Minn., assignors to Stimtech, Inc., Minneapolis, Minn.
Filed Jun. 21, 1978, Ser. No. 917,712
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—41



256,395
BUILDING
Richard G. Titus, Salt Lake City, Utah, assignor to Minit-Lube, Inc., Salt Lake City, Utah
Filed Oct. 10, 1978, Ser. No. 949,506
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22

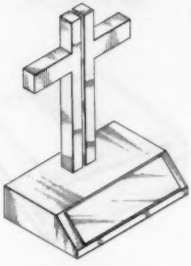


256,396
HAIR SPRAY FACE SHIELD
Lee E. Feilhauer, 10823 Marine View Dr. SW., Seattle, Wash. 98146
Filed Dec. 19, 1977, Ser. No. 861,896
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—9



256,397
PHOTOFLASH LAMP UNIT
Donald R. Schindler, Burton, and Thomas F. Soules, Cleveland Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.
Filed May 25, 1977, Ser. No. 800,463
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D26—2

256,398
STATUE
Hugh E. Mitchell, 910 E. Greystone Ave., Monrovia, Calif. 91016
Filed Feb. 14, 1978, Ser. No. 877,792
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D99—25



256,399
CROSS
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Mar. 23, 1978, Ser. No. 889,609
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D99—27

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF AUGUST, 1980

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. J. Bingley Limited: *See*—
Seymour-Smith, Donald, 4,216,863, Cl. 206-554.000.

A. R. Wood Manufacturing Company: *See*—
Kirchhofer, James E., 4,216,742, Cl. 119-18.000.

AB Scaniainventor: *See*—
Siwersson, Olle L.; Wall, Arne E.; and Loodberg, Jan A. T., 4,217,109, Cl. 44-1.0SR.

Abbe, Robert C.; and Poduje, Noel S., to ADE Corporation. Self inverting gauging system. 4,217,542, Cl. 324-57.00R.

Abbott Laboratories: *See*—
Cole, John W., 4,217,269, Cl. 260-112.50R.
Dren, Anthony T.; and Bopp, Barbara A., 4,217,351, Cl. 424-256.000.
Heitmann, Wayne R., 4,217,282, Cl. 260-326.50C.

Abex Corporation: *See*—
Born, Ellis H.; Wolfe, Paul B.; and Dillon, Leo H., 4,216,699, Cl. 91-3.000.
Griffith, Arvon M., 4,217,255, Cl. 260-17.200.

ACF Industries, Incorporated: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,216,726, Cl. 410-64.000.

Achelpohl, Fritz; and Mundus, Friedhelm, to Windmoller & Holscher. Apparatus for making carrier bags from two half-tubes running side-by-side. 4,216,705, Cl. 93-33.00H.

Achenbach, Karlheinz, to Olympia Werke AG. Developing device for developing electrostatic images with a magnetic brush. 4,216,740, Cl. 118-681.000.

Ackley, Charles E., Jr.: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,216,714, Cl. 101-40.000.

Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., to R. W. Hartnett Company. Method and apparatus for restraining capsule adherence to the printing roll. 4,216,714, Cl. 101-40.000.

Adachi, Masahiro: *See*—
Endo, Hiroshi; and Adachi, Masahiro, 4,217,582, Cl. 343-7.0VM.

Adams, Arthur C., to Bell Telephone Laboratories, Incorporated. Deposition of doped silicon oxide films. 4,217,375, Cl. 427-85.000.

Adams, John B., Jr., to Du Pont de Nemours, E. I., and Company. Stabilized maneb and preparation thereof. 4,217,293, Cl. 260-429.00K.

ADE Corporation: *See*—
Abbe, Robert C.; and Poduje, Noel S., 4,217,542, Cl. 324-57.00R.

Adinolfi, Robert G.: *See*—
Neal, James W.; Loersch, Joseph F.; and Adinolfi, Robert G., 4,217,190, Cl. 204-129.350.

Adolph Coors Company: *See*—
Bader, James S.; and Sciacca, James C., 4,216,859, Cl. 206-159.000.

Agache, Georges: *See*—
Oswald, Roger; and Agache, Georges, 4,216,744, Cl. 123-1.00A.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Garnier, Marcel A.; and Moreau, Rene J., 4,216,800, Cl. 137-807.000.
Oswald, Roger; and Agache, Georges, 4,216,744, Cl. 123-1.00A.

Agency of Industrial Science & Technology: *See*—
Komoriya, Kiyoshi, 4,216,701, Cl. 91-49.000.

AGFA-Gevaert, A.G.: *See*—
Steinlehner, Fritz; and Weidlich, Dieter, 4,217,093, Cl. 432-59.000.
Thurm, Siegfried; and Bunge, Konrad, 4,217,648, Cl. 364-526.000.

Air Cargo Equipment Corporation: *See*—
Byrd, Chester L., 4,216,927, Cl. 244-118.100.

Aisan Kogyo Kabushiki Kaisha: *See*—
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, 4,216,753, Cl. 123-445.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; Ohumi, Takeharu; and Tsunekawa, Masaru, 4,216,938, Cl. 251-65.000.

Aizenberg, Sergei A.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.

Ajinomoto Company, Incorporated: *See*—
Suzuki, Tadao, 4,217,419, Cl. 435-253.000.
Yasuda, Naohiko; Eguchi, Chikahiko; Okutsu, Masaru; and Hirose, Yoshiteru, 4,217,450, Cl. 544-25.000.

Akashi, Shunji, to Yoshida Kogyo KK. Woven fastener stringer. 4,216,805, Cl. 139-384.00B.

Akopov, Ernest M.; and Postolov, Petr M. Surgical apparatus for suturing organs with metal staples. 4,216,890, Cl. 227-22.000.

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Illum, Asger, 4,217,021, Cl. 339-95.00D.

Aktieselskabet Nordiske Kabel-OG Traadfabriker: *See*—
Andersen, Axel, 4,216,645, Cl. 57-212.000.

Akzona Incorporated: *See*—
Olivie, Jacques, 4,217,452, Cl. 544-246.000.
Viezee, Dirk J.; Mekkelholt, Petrus J. M.; and Juijn, Johannes A., 4,217,387, Cl. 428-288.000.

Albaret S.A.: *See*—
Degraeve, Francois R.; Divay, Rene G.; and Lecoeur, Jean-Pierre E., 4,216,838, Cl. 180-14.00R.

Albaric, Jacques E.: *See*—
Long, Lawrence J.; and Albaric, Jacques E., 4,217,515, Cl. 310-270.000.

Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, to Ciba-Geigy AG. Continuous reduction process. 4,217,304, Cl. 260-508.000.

Albrecht, Wolfgang, to Patent-Treuhand-Gesellschaft fur Elektrische Gluampen mbH. Fluorescent lamp base assembly. 4,217,630, Cl. 362-217.000.

Aldridge, Lionel D.; and Cotton, John K., to Burroughs Corporation. Dip socket having preloading and antiwicking features. 4,217,024, Cl. 339-275.00T.

Alegra Products, Inc.: *See*—
Graber, Helen E., 4,216,774, Cl. 128-296.000.

Alexander-Cooper, Inc.: *See*—
Alexander, William J., III; and Cooper, John S., 4,216,804, Cl. 139-311.000.

Alexander, William J., III; and Cooper, John S., to Alexander-Cooper, Inc. Loom cloth tension control. 4,216,804, Cl. 139-311.000.

Alexis, Raoul H., Jr. Cymbal stand and assembly. 4,216,696, Cl. 84-422.00R.

Alfa-Laval AB: *See*—
Sjoholm, Claes B.; and Johansson, Bengt O., 4,217,647, Cl. 364-510.000.

Alfieri, Robert L.; Grice, James D.; and Greene, William D. Electrically braked alternating current motor with plural, alternatively energizable brake windings. 4,217,532, Cl. 318-759.000.

Allegheny Ludlum Steel Corporation: *See*—
Hartline, Albert G., III, 4,217,136, Cl. 75-128.00A.
Hartline, Albert G., III, 4,217,150, Cl. 148-2.000.

Allen, Earl J.: *See*—
Herrington, George B.; and Allen, Earl J., 4,217,013, Cl. 312-322.000.

Allen, James A., to RCA Corporation. Carriage translating apparatus for video disc player. 4,216,969, Cl. 274-9.00B.

Allen, Oise R. Apparatus for safeguarding money. 4,216,901, Cl. 232-1.00D.

Allen, Roger E.: *See*—
Bartoli, Filbert J.; Esterowitz, Leon; Allen, Roger E.; and Kruer, Melvin R., 4,217,547, Cl. 324-158.00R.

Allison, William D. Mounting for windmills. 4,217,501, Cl. 290-55.000.

Alta Products Company: *See*—
Holden, Paul J., 4,217,465, Cl. 174-138.00F.

Altman, James E. Coring apparatus for fruit and the like. 4,216,712, Cl. 99-565.000.

AM International, Inc.: *See*—
Seelenbinder, Terry G., 4,217,016, Cl. 339-5.00M.

American Air Filter Company, Inc.: *See*—
Shuler, Bernard R., 4,217,122, Cl. 55-480.000.

American Cyanamid Company: *See*—
Bernady, Karel F.; and Mogolesko, Paul D., 4,217,308, Cl. 260-583.00P.
Coscia, Anthony T.; Panzer, Hans P.; and O'Connor Michael N. D., 4,217,262, Cl. 260-29.6SQ.
Hoffman, Joseph A.; Savides, Christos; and Oppelt, John C., 4,217,267, Cl. 260-45.75D.
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,215, Cl. 210-54.000.
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,443, Cl. 528-373.000.
Von, Isaiah, 4,217,273, Cl. 260-202.000.

American Dental Association Health Foundation: *See*—
Mabie, Curtis P.; and Menis, Daniel L., 4,217,264, Cl. 260-42.150.

American Electronics, Inc.: *See*—
Beaver, Richard C., 4,216,589, Cl. 33-266.000.

American Filtrona Corporation: *See*—
Byrne, Stanley W., 4,216,706, Cl. 93-77.0FT.

American Optical Corporation: *See*—
Richards, William; and Grolman, Bernard, 4,216,588, Cl. 33-189.000.

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Bubley, Henry J., 4,216,591, Cl. 34-18.000.

Ammon, J. Preston; and Weaver, Harry R., to Elfab Corporation. Printed circuit board, electrical connector and method of assembly. 4,216,576, Cl. 29-845.000.

AMP Incorporated: *See*—
Fritz, William B.; and Hopkins, John R., 4,217,155, Cl. 156-55.000.
Rossler, Frederick W., Jr.; and Anderson, Gerald M., 4,216,930, Cl. 248-56.000.

Andersen, Axel, to Aktieselskabet Nordiske Kabel-OG Traadfabriker. Wound cable and apparatus for forming cables. 4,216,645, Cl. 57-212.000.

Anderson, Bruce C., to GTE Laboratories Incorporated. Analog to digital converter having nonlinear amplitude transformation. 4,217,574, Cl. 340-347.0AD.

Anderson, Donald L.: *See*—
Squires, W. David; Anderson, Donald L.; and Cherry, Isaac R., 4,216,779, Cl. 128-682.000.

Anderson, Gerald M.: *See*—
Rossler, Frederick W., Jr.; and Anderson, Gerald M., 4,216,930, Cl. 248-56.000.

Anderson, Larry W.; and Sahasrabudhe, Arun P., to Westinghouse Electric Corp. Speed maintaining control of train vehicles. 4,217,643, Cl. 364-426.000.

Anderson, Nigel I. Tensioning of metal wires. 4,216,568, Cl. 24-136.00A.

Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. Phenoxybenzyl 2-indenyl-3-methylbutanoates. 4,217,302, Cl. 260-465.00D.

Anderson, Rogers H., to Honeywell Inc. Formation of halide optical elements by hydrostatic press forging. 4,217,318, Cl. 264-1.000.

Andrew, John E., to Boeing Company, The. Condenser/evaporator heat exchanger and method of using the same. 4,216,820, Cl. 165-1.000.

Angell, Howard N. Exploding bullet. 4,216,722, Cl. 102-91.000.

Anic, S.p.A.: *See*—
Dozzi, Giovanni; and Cucinella, Salvatore, 4,217,246, Cl. 252-429.00B.

Antony, Arthur P., to Aqua-Chem, Inc. Evaporator. 4,217,176, Cl. 202-173.000.

Aoki, Kazuhide; Kawagai, Kenji; Nagae, Akira; and Goto, Shuichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Monostable multivibrator. 4,217,505, Cl. 307-273.000.

Aonuma, Masashi; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Process for production of ferromagnetic powder. 4,217,152, Cl. 148-108.000.

Aonuma, Shigeo: *See*—
Tanaka, Koichi; Kobayashi, Kenji; and Aonuma, Shigeo, 4,217,406, Cl. 430-137.000.

Aoshiro, Hisatake, to Machida Endoscope Co., Ltd. Endoscope with closed pressurized inner cavity. 4,216,767, Cl. 128-6.000.

Apple Computer, Inc.: *See*—
Wozniak, Stephen G., 4,217,604, Cl. 358-16.000.

Appleton Papers Inc.: *See*—
Glanz, Kenneth D.; Becker, William J.; and Miller, Robert E., 4,217,162, Cl. 156-305.000.

Aprahamian, Robert; and Miller, Joseph, to TRW Inc. Pulsed chemical laser system. 4,217,558, Cl. 331-94.50C.

Aqua-Chem, Inc.: *See*—
Antony, Arthur P., 4,217,176, Cl. 202-173.000.

Arai, Nobukatsu: *See*—
Tojo, Kenji; Kousokabe, Hirokatu; Arai, Nobukatsu; and Sato, Eiji, 4,216,661, Cl. 62-505.000.

Arai, Takeo: *See*—
Ban, Keisuke; and Arai, Takeo, 4,216,682, Cl. 74-579.00E.

Araley, S.A.: *See*—
Siminovich, Samuel, 4,216,792, Cl. 137-209.000.

Archifar Laboratori Chimico Farmacologici S.p.A.: *See*—
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,276, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,277, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,278, Cl. 260-239.30P.

Arctic Enterprises, Inc.: *See*—
Dehnert, Douglas K., 4,217,006, Cl. 305-35.0EB.

Argus Chemical Corp.: *See*—
Minagawa, Motonobu; Sekiguchi, Tetsuo; and Nakazawa, Kenji, 4,217,258, Cl. 260-23.0XA.

Arlers, Sven; and Nilsson, LGunnar. Hypodermic syringe with aspiration effect. 4,216,771, Cl. 128-218.00P.

Armstrong Cork Company: *See*—
Heckles, John S., 4,217,396, Cl. 428-500.000.
Heckles, John S., 4,217,439, Cl. 528-220.000.

Arnaud, Pierre: *See*—
Rubel, Paul; and Arnaud, Pierre, 4,216,780, Cl. 128-699.000.

Arnold, Bernhard: *See*—
Pischtschan, Alfred; Wolf, Karlheinz; Hornle, Reinhold; Bremer, Fritz; Arnold, Bernhard; and Kullick, Werner, 4,217,266, Cl. 260-42.210.

Arnold, Sara J.: *See*—
Foster, Kenneth D.; and Arnold, Sara J., 4,217,557, Cl. 331-94.50G.

Arnott, David R.: *See*—
Baxter, William J.; and Arnott, David R., 4,217,180, Cl. 204-1.00T.

Aro Corporation, The: *See*—
Brandenberg, Karl A., 4,216,799, Cl. 137-625.660.
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,216,630, Cl. 51-170.00T.

Arons, Gilbert N.; and Macnair, Richard N., to United States of America, Army. Laminated, highly sorbent, active carbon fabric. 4,217,386, Cl. 428-198.000.

Asahi Glass Company, Limited: *See*—
Nakaya, Keiichi; Sato, Kimihiko; and Konishi, Kenji, 4,217,330, Cl. 422-193.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Sugiyama, Takahiro, 4,217,034, Cl. 350-214.000.

Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, to Mitsubishi Denki Kabushiki Kaisha. Device for manufacturing stator cores. 4,216,892, Cl. 228-44.10R.

Asano, Koin, to Kanebo Ltd. Leather-like sheet material comprising a urethane elastomer produced from polydipropylene adipate and the process of producing said material. 4,217,381, Cl. 427-340.000.

Ashton, Michael E.; and Key, Anthony J., to Thermit Welding GB Limited; and British Railways Board. Aluminothermic welding of austenitic manganese steel. 4,216,816, Cl. 164-54.000.

Asmus, Carl J., to Clayton Manufacturing Company. Vehicle exhaust handling system. 4,216,710, Cl. 98-115.00R.

Ault, Thomas W., to General Foods Corporation. Slip sheet repositioning apparatus. 4,217,071, Cl. 414-395.000.

Austerman, Stanley B., to Rockwell International Corporation. Method of growing large low defect, monocrystals of BeO. 4,217,167, Cl. 156-624.000.

Austin, John J., Jr., to Champion International Corporation. Container with an integrally formed spout and blank therefor. 4,216,864, Cl. 206-622.000.

Automobiles Peugeot: *See*—
Mauron, Gerard, 4,216,978, Cl. 280-803.000.

Autran, Jean-Michel, to Thomson-CSF. Elastic surface wave device for treating high frequency signals. 4,217,564, Cl. 333-152.000.

Avdzhiev, Georgy R.; and Ruzin, Leonid M. Plugging fluid. 4,217,146, Cl. 106-285.000.

Avon Products, Inc.: *See*—
McCoy, John W., 4,216,854, Cl. 198-481.000.

Avritt, Michael D.; Lamos, Richard A.; and Rosati, Alfonso A., to International Business Machines Corporation. Jam clearance mechanism for a traveling distributor in a collating system. 4,216,955, Cl. 271-296.000.

Aykanian, Ardashus A., to Flexible Plastic Straw Corporation. Flexible tube. 4,216,801, Cl. 138-121.000.

B. F. Goodrich Company, The: *See*—
Kroenke, William J., 4,217,292, Cl. 260-429.00R.

B & K Machinery International Limited: *See*—
Whike, Alan S.; and Dusil, Richard, 4,217,090, Cl. 432-8.000.
Whike, Alan S.; and Dusil, Richard, 4,217,091, Cl. 432-8.000.

Baba, Nobuyuki; and Hashimoto, Tsutomu, to Toyo Soda Manufacturing Co., Ltd. Gel permeation chromatograph system. 4,217,223, Cl. 210-198.00C.

Babcock-Brown Boveri Reaktor GmbH: *See*—
Zintel, Jakob; and Zipser, Rudolf, 4,216,670, Cl. 73-46.000.

Babcock Krauss-Maffei Industrieanalgen GmbH: *See*—
Quittkat, Wolfram; and Frank, Dieter, 4,217,092, Cl. 432-14.000.

Babcock & Wilcox Company, The: *See*—
Jabsen, Felix S., 4,217,173, Cl. 176-19.0LD.

Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A. Method of manufacturing fibrous sheet material. 4,217,169, Cl. 162-100.000.

Bader, James S.; and Sciacca, James C., to Adolph Coors Company. Can clip and package. 4,216,859, Cl. 206-159.000.

Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Portable standardized card adapted to provide access to a system for processing electrical signals and a method of manufacturing such a card. 4,216,577, Cl. 29-831.000.

Baer, Ralph H.: *See*—
Morrison, Howard J.; Baer, Ralph H.; and Breslow, Jeffrey D., 4,216,965, Cl. 273-237.000.

Baessler, Konrad: *See*—
Planker, Siegfried; Baessler, Konrad; and Fuchs, Otto, 4,217,307, Cl. 260-569.000.

Bair, Eugene C.; and Kindig, Alan L., to General Electric Company. Jump mechanism. 4,216,806, Cl. 140-92.100.

Bakal, Abraham I.: *See*—
Witzel, Frank; Mackay, Donald A. M.; Bakal, Abraham I.; and Clark, K. Warren, 4,217,368, Cl. 426-5.000.

Baker, Ralph N., III; Bond, James D.; and Olson, Byron W. Refrigeration means and methods. 4,216,658, Cl. 62-99.000.

Bakuniak, Edmund: *See*—
Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga, 4,217,365, Cl. 424-329.000.

Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., to Nalco Chemical Company. Paper fiber additive containing polyacrylamide blended with glyoxal and polymeric diallyldimethyl ammonium chloride as a cationic regulator. 4,217,425, Cl. 525-155.000.

Balson, Nicholas. Cassette tape position indicator. 4,217,614, Cl. 360-132.000.

Ban, Keisuke; and Arai, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Fiber-reinforced light alloy cast article. 4,216,682, Cl. 74-579.00E.

Bando, Yasuo: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; Bando, Yasuo; and Hisayuki, Terumi, 4,217,309, Cl. 568-477.000.

Banner Engineering Corp.: *See*—
Fayfield, Robert W., 4,217,492, Cl. 250-239.000.

Barabino, Raymond C.; and Keyes, Melvin H., to Technicon Instruments Corporation. Immobilization of an enzyme substrate. 4,217,415, Cl. 435-98.000.

Bardos, Peter A.; and Crowe, John E., to Gould Advance Limited. Regulated power supply system including saturable reactor means. 4,217,632, Cl. 363-26.000.

Barkey, Kenneth T., to Eastman Kodak Company. Method for making branched polyesters reproducibly. 4,217,440, Cl. 528-274.000.

Barnes, Arthur C.: *See*—
Barnes, Carl E.; and Barnes, Arthur C., 4,217,442, Cl. 528-313.000.

Barnes, Carl E.; and Barnes, Arthur C. Polymerization of 2-pyrrolidone with alkali metal pyrrolidonates and certain quaternary ammonium salts. 4,217,442, Cl. 528-313.000.

Barr & Stroud Limited: *See*—
MacGregor, Stuart; and Berry, Peter J., 4,217,608, Cl. 358-113.000.

Barry, George H.; and Dahl, Ernest A. Battery monitoring system. 4,217,645, Cl. 364-483.000.

Bartl, Herbert: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,217,437, Cl. 528-171.000.

Bartoli, Filbert J.; Esterowitz, Leon; Allen, Roger E.; and Kruer, Melvin R., to United States of America, Navy. Method for determining the compensation density in n-type narrow-gap semiconductors. 4,217,547, Cl. 324-158.00R.

BASF Aktiengesellschaft: *See*—
Hjortzberg, Bernhard A., 4,217,603, Cl. 358-12.000.
Hoch, Helmut; and Hiller, Heinrich, 4,217,455, Cl. 546-37.000.
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, 4,217,460, Cl. 562-609.000.
Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, 4,217,431, Cl. 526-68.000.

BASF Wyandotte Corporation: *See*—
Boehmer, Matthew A., 4,217,289, Cl. 260-400.000.
Newkirk, David D.; and Login, Robert B., 4,217,390, Cl. 428-395.000.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,217,394, Cl. 428-457.000.

Basile, Peter A.; Bochmann, Carl E.; and Halbeisen, Jack, to Clorox Company, The. Bellows neck squeeze fluid dispenser. 4,216,882, Cl. 222-207.000.

Basmajian, Vahan V.; and Haldeman, Charles W., to Megatech Corporation. Nuclear power demonstrating. 4,216,593, Cl. 35-10.000.

Battelle Memorial Institute: *See*—
Doniat, Denis; Corajoud, Jean-Michel; Mosetti, Jacques; and Porta, Augusto, 4,217,191, Cl. 204-130.000.

Bauer, Gerald L., to Sterling Durg Inc. Removal of solids from a wet oxidation reactor. 4,217,218, Cl. 210-63.00R.

Baumann, Gert F.: *See*—
Szabat, John F.; Baumann, Gert F.; and Copeland, Gaeta L., 4,217,247, Cl. 252-431.00C.

Baumann, Kurt: *See*—
Hengartner, Alex; Wachter, Peter; and Baumann, Kurt, 4,216,915, Cl. 239-698.000.

Baumgartl, Horst: *See*—
Lubbers, Dietrich M.; Baumgartl, Horst; and Saito, Yukio, 4,217,194, Cl. 204-192.0SP.

Bausch & Lomb Incorporated: *See*—
Letter, Eugene C.; and Su, Kai C., 4,217,038, Cl. 351-160.00R.

Baxter Travenol Laboratories, Inc.: *See*—
Cullis, Herbert M.; and Dorsey, Evelyn E., 4,216,770, Cl. 128-214.00R.

Baxter, William J.; and Arnott, David R., to General Motors Corporation. Method of determining susceptibility of alloys to stress corrosion cracking. 4,217,180, Cl. 204-1.00T.

Bayer Aktiengesellschaft: *See*—
Dorlars, Alfons; and Neuner, Otto, 4,217,449, Cl. 542-462.000.
Elfert, Klaus; Wolf, Gerhard D.; Bentz, Francis; and Kunzel, Hans E., 4,217,227, Cl. 210-500.00M.
Germerdonk, Rolf; Jonas, Adam; Gockel, Claus; Huning, Werner; and Borger, Gotz-Gerald, 4,217,316, Cl. 261-123.000.
Jennen, Friedrich; and Tricoire, Jean, 4,217,373, Cl. 427-2.000.
Lantzsch, Reinhard, 4,217,300, Cl. 260-465.00D.
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.
Nink, Reinhard, 4,217,166, Cl. 156-605.000.
Pischtschan, Alfred; Wolf, Karlheinz; Hornle, Reinhold; Bremer, Fritz; Arnold, Bernhard; and Kullick, Werner, 4,217,266, Cl. 260-42.210.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,217,437, Cl. 528-171.000.
Steffan, Guido; Borgmann, Ernst; Buchel, Peter; and Harms, Wolfgang, 4,217,209, Cl. 210-53.000.
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.

Bayless, John H., to Du Pont de Nemours, E. I., and Company. Modified polyester films. 4,217,441, Cl. 528-293.000.

BBC Brown, Boveri & Company, Limited: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,217,035, Cl. 350-338.000.
Perregaux, Alain, 4,217,160, Cl. 156-239.000.
Popp, Gerhard; and Held, Gerhard, 4,217,154, Cl. 148-189.000.

Beach, William A.: *See*—
Fismer, William L.; and Beach, William A., 4,217,224, Cl. 210-231.000.

Bean, Eric R., to C. G. Conn, Ltd. Octave assignment system for electronic musical instrument. 4,216,691, Cl. 84-1.010.

Bean, John R. H., to Brickwood Holdings Proprietary Limited. Tamper-proof container. 4,216,872, Cl. 215-253.000.

Beasley, Glenn H., to Rohm and Haas Company. Anion exchange resins prepared from crosslinked polystyrenesulfonylchloride. 4,217,421, Cl. 521-32.000.

Beatrice Foods Co.: *See*—
Chow, Ho, 4,216,982, Cl. 285-315.000.

Beauchamp, Roger P., to International Packaging Corp. Wristwatch display package. 4,216,858, Cl. 206-45.150.

Beaver, Richard C., to American Electronics, Inc. Sighting device for surveillance camera. 4,216,589, Cl. 33-266.000.

Bechman, William H.: *See*—
Brundidge, Clayton L.; and Bechman, William H., 4,216,702, Cl. 91-436.000.

Becker, Kunibert: *See*—
Lagodka, Gunter; Rosenberg, Harry; Becker, Kunibert; and Dunkel, Gerd, 4,217,067, Cl. 405-296.000.

Becker, William J.: *See*—
Glanz, Kenneth D.; Becker, William J.; and Miller, Robert E., 4,217,162, Cl. 156-305.000.

Beckerman, Howard L.: *See*—
Marsh, Walter H.; Beckerman, Howard L.; and Dob, Allan M., 4,216,732, Cl. 112-158.00B.

Beecham Group Limited: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,447, Cl. 542-426.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,448, Cl. 542-427.000.

Behlke, Harold O. Surgical stapler. 4,216,891, Cl. 227-30.000.

Behringer, Donald F.: *See*—
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., 4,217,617, Cl. 361-51.000.

Behringwerke Aktiengesellschaft: *See*—
Bohn, Hans; and Winckler, Wilhelm, 4,217,339, Cl. 424-12.000.

Bell & Howell Company: *See*—
Zellner, John R.; Lehto, Eino M.; and Polinsky, Michael V., 4,217,039, Cl. 353-27.00R.

Bell Telephone Laboratories, Incorporated: *See*—
Adams, Arthur C., 4,217,375, Cl. 427-85.000.
Howarth, Louis E., 4,217,030, Cl. 350-96.210.
Hubbard, William M., 4,217,488, Cl. 455-612.000.
Kinder, George W.; and Winter, Harry, 4,217,524, Cl. 315-364.000.
MacChesney, John B.; and O'Connor, Paul B., 4,217,027, Cl. 350-96.300.
Smith, George E.; and Tompsett, Michael F., 4,217,600, Cl. 357-24.000.

Bellavoine, Robert, to De Pruines ISECO S.A. Individual prepared meal tray. 4,217,476, Cl. 219-10.55E.

Bendix Corporation, The: *See*—
Galan, Louis, 4,216,752, Cl. 123-499.000.
Tawfik, David A.; Doniger, Jerry; and Porawski, Donald J., 4,217,486, Cl. 371-68.000.

Benoit, Roland A., to Inter Royal Corporation. Tablet side arm for chairs. 4,216,994, Cl. 297-162.000.

Benton, Stephen A., to Polaroid Corporation. Production of volume dielectric holograms. 4,217,405, Cl. 430-2.000.

Bentz, Francis: *See*—
Elfert, Klaus; Wolf, Gerhard D.; Bentz, Francis; and Kunzel, Hans E., 4,217,227, Cl. 210-500.00M.

Berger, Joel G., to Endo Laboratories, Inc. Process for stereoselectively reducing indole derivatives. 4,217,454, Cl. 546-50.000.

Bergeron, John A.: *See*—
Uzgiris, Egidijus E.; and Bergeron, John A., 4,217,195, Cl. 204-195.00F.

Bergkvist, Lars A. Device for adjusting an object to assume a predetermined angle to a certain plane. 4,217,631, Cl. 362-348.000.

Bergna, Horacio E., to Du Pont de Nemours, E. I., and Company. Stable aluminosilicate aquasols having uniform size particles and their preparation. 4,217,240, Cl. 252-313.00S.

Berkowitz, Sidney, to FMC Corporation. Alkyl glyceryl ether sulfate salts and process for their preparation. 4,217,296, Cl. 260-458.00R.

Bernady, Karel F.; and Mogolesko, Paul D., to American Cyanamid Company. Process for preparing N-alkylethylenediamines. 4,217,308, Cl. 260-583.00P.

Berol Kemi AB: *See*—
Karlsson, Bengt G., 4,217,235, Cl. 252-184.000.

Berry, Peter J.: *See*—
MacGregor, Stuart; and Berry, Peter J., 4,217,608, Cl. 358-113.000.

Berry, Thomas: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,217,323, Cl. 264-235.000.

Bertau, Edith: *See*—
Jacques, Andre; Malsot, Christian; Moronvalle, Chantal; and Bertau, Edith, 4,217,084, Cl. 425-321.000.

Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,216,566, Cl. 17-25.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Tenderizer. 4,216,566, Cl. 17-25.000.

Bielecki, Andrzej: *See*—
Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga, 4,217,365, Cl. 424-329.000.
Biggs, Ian: *See*—
Moring, Peter L. E.; and Biggs, Ian, 4,216,856, Cl. 198-847.000.
Binder, Burton A. Composite building column. 4,216,634, Cl. 52-309.900.
Bindle, Edward A.; Theriault, Julius E.; and Toll, Wesley J. Automobile headlight change system. 4,217,626, Cl. 362-67.000.
BioMass Fuel Conversion Associates, Inc.: *See*—
Crane, Theodore H., 4,217,211, Cl. 210-7.000.
Bios Inc.: *See*—
Dam, Naim G.; Picunko, Thomas; and Kramer, Henry H., 4,217,642, Cl. 364-416.000.
BJ-Hughes Inc.: *See*—
Kelly, Robert R., 4,216,590, Cl. 33-304.000.
Black Bocs, Ltd.: *See*—
Olmstead, Edward A., 4,217,636, Cl. 364-200.000.
Blair, Jr.; Charles M., to Magna Corporation. Method of recovering petroleum from a subterranean reservoir incorporating an acylated polyether polyol. 4,216,828, Cl. 166-274.000.
Blankenburg, Heinz; Schafer, Peter; and Herrmann, Friedrich, to Rockwell-Golde, G.m.b.H. Window winder for slidable windows, especially for automobiles. 4,216,624, Cl. 49-352.000.
Blassel, Pierre P.; and Jacquet, Paul M. Radio jamming device. 4,217,550, Cl. 455-1.000.
Blue Wing Corporation: *See*—
Rawlings, Robert M.; and Procter, Donald, 4,217,370, Cl. 426-98.000.
Bochmann, Carl E.: *See*—
Basile, Peter A.; Bochmann, Carl E.; and Halbeisen, Jack, 4,216,882, Cl. 222-207.000.
Boehmer, Matthew A., to BASF Wyandotte Corporation. Process for purification of the alkali metal salt of sulfonated unsaturated aliphatic carboxylic acid. 4,217,289, Cl. 260-400.000.
Boeing Commercial Airplane Company: *See*—
Harris, Alfred W., 4,216,923, Cl. 244-110.00B.
Boeing Company, The: *See*—
Andrew, John E., 4,216,820, Cl. 165-1.000.
Deminet, Czeslaw, 4,216,765, Cl. 126-449.000.
Boettcher, Klaus: *See*—
Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, 4,217,431, Cl. 526-68.000.
Bohn, Hans; and Winckler, Wilhelm, to Behringwerke Aktiengesellschaft. Glycoprotein and process for isolating it. 4,217,339, Cl. 424-12.000.
Boise Cascade Corporation: *See*—
Westphal, Teddy M., 4,216,736, Cl. 113-121.00C.
Boliden Aktiebolag: *See*—
Bostrom, Karl-Johan, 4,217,072, Cl. 414-412.000.
Bombray, Marcel; and Caugant, Jean, to Compagnie Generale de Radiologie. Radiodiagnosis apparatus with removable intensifying screens. 4,217,500, Cl. 250-469.000.
Bond, James D.: *See*—
Baker, Ralph N., III; Bond, James D.; and Olson, Byron W., 4,216,658, Cl. 62-99.000.
Boney, George R.: *See*—
Kellenbenz, Carl W.; and Boney, George R., 4,217,618, Cl. 361-56.000.
Bonnes, Eugene D.; Kotian, Vijayraj M.; and MenMuir, Paul C., to Eaton Corporation. Composite tubing product. 4,216,802, Cl. 138-143.000.
Bonneson, Garland W.; and Johnson, Kenneth V., to Bucyrus-Erie Company. Crane mounting. 4,216,870, Cl. 212-223.000.
Boone Bait Company, Inc.: *See*—
Showalter, Joseph S., 4,216,605, Cl. 43-42.530.
Bopp, Barbara A.: *See*—
Dren, Anthony T.; and Bopp, Barbara A., 4,217,351, Cl. 424-256.000.
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, to Swiss Aluminium Ltd. High temperature reactor. 4,217,479, Cl. 219-121.00P.
Borg-Warner Corporation: *See*—
Butterfield, Roger P.; Wade, David C.; and Woollard, Gary A., 4,216,678, Cl. 474-12.000.
Falk, John C.; and Wyatt, James, 4,217,427, Cl. 525-176.000.
Tuzson, John J., 4,216,677, Cl. 74-17.800.
Borger, Gotz-Gerald: *See*—
Germerdonk, Rolf; Jonas, Adam; Gockel, Claus; Huning, Werner; and Borger, Gotz-Gerald, 4,217,316, Cl. 261-123.000.
Borgmann, Ernst: *See*—
Steffan, Guido; Borgmann, Ernst; Buchel, Peter; and Harms, Wolfgang, 4,217,209, Cl. 210-53.000.
Born, Ellis H.; Wolfe, Paul B.; and Dillon, Leo H., to Abex Corporation. Electrohydraulic control for an axial piston pump. 4,216,699, Cl. 91-3.000.
Bostrom, Karl-Johan, to Boliden Aktiebolag. Method and apparatus for opening barrels and for emptying said barrels of their contents without polluting the environment. 4,217,072, Cl. 414-412.000.
Bottenbruch, Hermann, to Karrena GmbH. Chimney. 4,216,709, Cl. 98-58.000.
Boucher, Joseph N. Player controlled tilting game having an electronic display and control system. 4,216,963, Cl. 273-110.000.
Bourdeau, Romeo G., to United Technologies Corporation. Spin cup means for the production of metal powder. 4,217,082, Cl. 425-8.000.
Bourke, Robert F.; and Thimmesch, David M., to Gould Inc. Electrical vehicle controller with programmed motor current. 4,217,527, Cl. 318-139.000.
Bourke, Robert F.; and Thimmesch, David M., to Gould Inc. Propulsion system for electrical vehicle. 4,217,529, Cl. 318-351.000.
Bourne, Alan J., to Dunlop Limited. Pneumatic tire containing puncture sealants. 4,216,812, Cl. 152-330.00L.
Bowen, Ray J.; and Bowen, William R. Method of underground mining by pillar extraction. 4,216,998, Cl. 299-11.000.
Bowen, William R.: *See*—
Bowen, Ray J.; and Bowen, William R., 4,216,998, Cl. 299-11.000.
Bowles, Arnold G., to Pressure Technology, Inc. Isostatic apparatus for treating articles with heat and pressure. 4,217,087, Cl. 425-78.000.
Boynton, Robert J.: *See*—
Livermore, Frederick C.; and Boynton, Robert J., 4,217,480, Cl. 219-216.000.
Bozik, John E.: *See*—
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,217,287, Cl. 260-348.290.
Bradford, George J.: *See*—
Caltagirone, Anthony V.; Bradford, George J.; and Parro, James J., 4,217,646, Cl. 364-493.000.
Braid, Milton, to Mobil Oil Corporation. Antioxidant compositions. 4,217,232, Cl. 252-46.400.
Brain Dust Patents Establishment: *See*—
Kuchler, Fritz, 4,217,650, Cl. 364-567.000.
Brandenberg, Karl A., to Aro Corporation, The. Sequential AND fluid logic device. 4,216,799, Cl. 137-625.660.
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., to Givaudan Corporation; and Hoffmann-La Roche Inc. Preservation of aqueous systems with α-chloro-β-aminocrotonamide. 4,217,363, Cl. 424-320.000.
Braukmann Armaturen AG: *See*—
Braukmann, Heinz W., 4,216,902, Cl. 236-42.000.
Braukmann, Heinz W., to Braukmann Armaturen AG. Thermostatic control valve. 4,216,902, Cl. 236-42.000.
Braun, Richard R.; Petaja, Glen E.; and Cedar, Charles E., to L & M Radiator, Inc. Spacer for removable heat exchanger tubes. 4,216,824, Cl. 165-69.000.
Brcar, Anton, to Titovi Zavodi Litostroj Ljubljana n.sol.o. Two-stage/-single-stage reversible pump-turbine with supplying pump. 4,217,077, Cl. 417-407.000.
Bremer, Fritz: *See*—
Pischtschan, Alfred; Wolf, Karlheinz; Hornle, Reinhold; Bremer, Fritz; Arnold, Bernhard; and Kullick, Werner, 4,217,266, Cl. 260-42.210.
Bremer, Wolfgang: *See*—
Hauler, Peter; Bremer, Wolfgang; Weiss, Karl-Ernst; and Heintz, Frieder, 4,217,512, Cl. 310-155.000.
Breslow, Jeffrey D.: *See*—
Morrison, Howard J.; Baer, Ralph H.; and Breslow, Jeffrey D., 4,216,965, Cl. 273-237.000.
Bresson, Clarence R., to Phillips Petroleum Company. Asphaltic concrete compositions comprising diene/vinyl aromatic copolymers. 4,217,259, Cl. 260-28.5AS.
Breuer, Hermann: *See*—
Treuner, Uwe D.; and Breuer, Hermann, 4,217,348, Cl. 424-246.000.
Brichima S.p.A.: *See*—
Maggioni, Paolo; Mauri, Francesco; and Citterio, Attilio, 4,217,290, Cl. 260-404.000.
Brickwood Holdings Proprietary Limited: *See*—
Bean, John R. H., 4,216,872, Cl. 215-253.000.
Bridgnell, David G.; and Jacobsen, Frederick W., to Garrett Corporation, The. Heat exchanger mounting device. 4,216,937, Cl. 248-562.000.
Bristol-Myers Company: *See*—
Lim, Gary M. F.; and Droghini, Roberto D., 4,217,275, Cl. 260-239.100.
Vida, Julius A.; and Kerridge, Kenneth A., 4,217,274, Cl. 260-239.100.
British Railways Board: *See*—
Ashton, Michael E.; and Key, Anthony J., 4,216,816, Cl. 164-54.000.
Brown, Albert E.: *See*—
Scott, Michael A.; Brown, Albert E.; and Young, Edward, 4,217,388, Cl. 428-307.000.
Brown, Elmer L. Perpetual calendar. 4,216,596, Cl. 40-118.000.
Brown, Harry B., Jr.: *See*—
Gerding, Charles C.; and Brown, Harry B., Jr., 4,217,177, Cl. 202-248.000.
Brown Oil Tools, Inc.: *See*—
Wardlaw, Harold W. R., 4,216,834, Cl. 175-7.000.
Browne, Ronald O. Reflux check valve. 4,216,791, Cl. 137-199.000.
Brueckner, Gerald G.; and Cantrell, Edward. Telescopic sight mount. 4,216,600, Cl. 42-1.0ST.
Brundidge, Clayton L.; and Bechman, William H., to Eaton Yale Ltd. Pressure sensing regenerative hydraulic system. 4,216,702, Cl. 91-436.000.
Brunelle, Daniel J.; and Smith, William E., to General Electric Company. Polycarbonate transesterification process. 4,217,438, Cl. 528-202.000.
Brunswick Corporation: *See*—
Hofmann, Robert A.; and Kusche, David W., 4,216,984, Cl. 292-91.000.
Puryear, John W., 4,216,921, Cl. 242-84.20R.

Bryant, Herman G., Jr.: *See*—
Norman, Vello; and Bryant, Herman G., Jr., 4,216,784, Cl. 131-17.00R.

Bryant-Poff, Inc.: *See*—
Poff, James L., 4,216,853, Cl. 193-32.000.

Brzozowski, Henri, to Societe Anonyme, Compagnie Industrielle des Telecommunications Cit-Alcatel. Circuits for reducing intermodulation noise. 4,217,554, Cl. 330-124.00R.

Bubley, Henry J., to American Screen Printing Equipment Co. Dryer for printed material. 4,216,591, Cl. 34-18.000.

Buchel, Peter: *See*—
Steffan, Guido; Borgmann, Ernst; Buchel, Peter; and Harms, Wolfgang, 4,217,209, Cl. 210-53.000.

Bucyrus-Erie Company: *See*—
Bonneson, Garland W.; and Johnson, Kenneth V., 4,216,870, Cl. 212-223.000.

Budzich, Tadeusz. Load responsive control valve. 4,216,797, Cl. 137-596.130.

Buechner, Oskar: *See*—
Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, 4,217,431, Cl. 526-68.000.

Buell, Kenneth B., to Procter & Gamble Company, The. Apparatus for forming a continuous reinforced fibrous web. 4,217,078, Cl. 425-81.100.

Bugnone, Aldo. Apparatus for the testing of printing or like cylinders for operating on web material. 4,216,676, Cl. 73-432.00R.

Bullock, Robert F. Apparatus for perforating slices of food product. 4,216,690, Cl. 83-114.000.

Bunge, Konrad: *See*—
Thurm, Siegfried; and Bunge, Konrad, 4,217,648, Cl. 364-526.000.

Bunker Ramo Corporation: *See*—
Cameron, John K., 4,217,019, Cl. 339-40.000.

Burck, Joseph M.: *See*—
Erickson, Erick E.; Wildman, John R.; Meyer, Burton C.; and Burck, Joseph M., 4,216,612, Cl. 46-103.000.

Burge, Harland L.; Hardgrove, John A.; and Krieve, Walter F., to TRW Inc. Method for in-flight combustion of carbonaceous fuels. 4,217,132, Cl. 75-26.000.

Burklund, Vernon D.: *See*—
Hooper, John O.; Stone, W. James; and Burklund, Vernon D., 4,216,928, Cl. 244-122.0AD.

Burmann, Jurgen: *See*—
Sieweke, Wilhelm; Nettler, Hubert; and Burmann, Jurgen, 4,216,946, Cl. 266-87.000.

Burnham, Robert D.: *See*—
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,217,561, Cl. 331-94.50H.

Burroughs Corporation: *See*—
Aldridge, Lionel D.; and Cotton, John K., 4,217,024, Cl. 339-275.00T.
Walton, Charles E., II, 4,216,668, Cl. 72-412.000.

Busetto, Carlo: *See*—
Corbellini, Margherita; Gamba, Alessandro; and Busetto, Carlo, 4,217,245, Cl. 252-429.00B.

Bushong, James A.: *See*—
Hagedorn, Floyd T.; Rahrig, Donald D.; Revells, Robert G.; and Bushong, James A., 4,217,126, Cl. 65-106.000.

Butcher, Alan G.; and Wong, Chan-Po, to Dresser Europe, S.A. Liquid flow meter. 4,216,674, Cl. 73-861.010.

Butler, William S.: *See*—
Farris, Richard C.; and Butler, William S., 4,216,570, Cl. 29-434.000.

Butterfield, Roger P.; Wade, David C.; and Woollard, Gary A., to Borg-Warner Corporation. Drive system. 4,216,678, Cl. 474-12.000.

Byrd, Chester L., to Air Cargo Equipment Corporation. Baggage handling and storage system. 4,216,927, Cl. 244-118.100.

Byrne, Stanley W., to American Filtrona Corporation. Manufacture of smoking articles. 4,216,706, Cl. 93-77.0FT.

C. G. Conn, Ltd.: *See*—
Bean, Eric R., 4,216,691, Cl. 84-1.010.

Caltagirone, Anthony V.; Bradford, George J.; and Parro, James J., to Singer Company, The. Automatic control system for a building. 4,217,646, Cl. 364-493.000.

Cambio, Orlando D., Jr., to Respiratory Care, Inc. Method of blow molding a bottle with a diffuser. 4,217,328, Cl. 264-504.000.

Cameron, John K., to Bunker Ramo Corporation. BMI Protected connector assembly. 4,217,019, Cl. 339-40.000.

Campbell, William L., to Monsanto Company. Method for making bicomponent polyester yarns at high spinning rates. 4,217,321, Cl. 264-168.000.

Canada, Atomic Energy of, Limited: *See*—
Nejedly, Peter; and Whitfield, Douglas W., 4,217,569, Cl. 338-2.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Foster, Kenneth D.; and Arnold, Sara J., 4,217,557, Cl. 331-94.50G.

Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., to Clopay Corporation. Method of forming tear lines in plastic films. 4,217,327, Cl. 264-293.000.

Canon Kabushiki Kaisha: *See*—
Hirano, Reiji; Mochizuki, Koichi; Yasui, Tokio; and Shimazu, Jyoji, 4,217,656, Cl. 364-710.000.
Nakata, Shinichi, 4,217,653, Cl. 364-705.000.
Sato, Yasuhisa; Tajima, Akira; and Ono, Yukiharu, 4,217,050, Cl. 354-225.000.

Cantrell, Edward: *See*—
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Carl Hurth Maschinen- und Zahnradfabrik: *See*—
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,216,737, Cl. 440-61.000.

Carlin, Robert N., to Rolls-Royce Limited. Brake mechanism for rotary parts. 4,216,909, Cl. 239-265.310.

Carlson, David E., to RCA Corporation. Compensated amorphous silicon solar cell. 4,217,148, Cl. 136-89.0SJ.

Carnavos, Theodore C.; and Golymbieski, Walter J., to Noranda Mines Limited. Method of reforming the fins of a finned tube. 4,216,575, Cl. 29-597.000.

Carnes, James E.; Dawson, Robert H.; and Kosonocky, Walter F. Comb filter employing a charge transfer device with plural mutually proportioned signal charge inputs. 4,217,605, Cl. 358-31.000.

Carre, Jacques, to Socapex. Connector with optical inspections means for ribbon cable. 4,217,022, Cl. 339-99.00R.

Carter, Efton T. Fly-tying vise. 4,216,948, Cl. 269-71.000.

Carter, Robert E.: *See*—
Wright, Richard V.; and Carter, Robert E., 4,216,644, Cl. 57-58.890.

Case, Derek F.: *See*—
Ridgway, Peter C.; and Case, Derek F., 4,217,168, Cl. 430-320.000.

Cash, David R., to James Cash Machine Co. Panel cutting machine and method. 4,216,688, Cl. 83-42.000.

Catalyst Research Corporation: *See*—
O'Boyle, Matthew; Schneider, Alan A.; and Magladry, Ross E., 4,217,403, Cl. 429-162.000.

Catanese, Carmen A.; and Cosentino, Louis S., to RCA Corporation. Isolation busbar for a flat panel display device. 4,217,519, Cl. 313-411.000.

Caterpillar Tractor Co.: *See*—
Kessinger, Orville E., Jr., 4,216,973, Cl. 277-92.000.

Caugant, Jean: *See*—
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Cedar, Charles E.: *See*—
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Celanese Corporation: *See*—
Kuzma, Edward J., 4,217,257, Cl. 260-22.0CB.

Celotex Corporation, The: *See*—
Medica, Joseph J.; and Hahn, William T., 4,217,380, Cl. 427-287.000.

CGEE Alsthom: *See*—
Grillet, Charles, 4,216,724, Cl. 104-258.000.

Champion International Corporation: *See*—
Austin, John J., Jr., 4,216,864, Cl. 206-622.000.

Chang, I-Cheng, to Itek Corporation. Acoustic-optic coherent modulator and detection system. 4,217,036, Cl. 350-358.000.

Chang, Nuke M.; and Renshaw, Robin, to Santa Fe International Corporation. Automatic pipe welding apparatus and method. 4,216,896, Cl. 228-212.000.

Chatterjea, Probir K., to International Harvester Company. Transmission clutches with fully-resetting modulator-load-piston. 4,216,851, Cl. 192-4.00A.

Chausse, Leon C., to Inland Manufacturing Company. Radiator hoist and positioner. 4,216,947, Cl. 269-71.000.

Chemische Werke Huls A.G.: *See*—
Schneider, Wolfgang; Von Praun, Ferdinand; and Niehaves, Kurt, 4,217,106, Cl. 8-127.000.

Chemko Industries, Inc.: *See*—
Cyphert, Gilbert G., 4,216,563, Cl. 15-321.000.

Cherry, Isaac R.: *See*—
Squires, W. David; Anderson, Donald L.; and Cherry, Isaac R., 4,216,779, Cl. 128-682.000.

Chervenak, Michael C., to Hydrocarbon Research, Inc. Integrated coal cleaning, liquefaction, and gasification process. 4,217,201, Cl. 208-8.00R.

Chevron Research Company: *See*—
Frost, Kenneth A., Jr., 4,217,111, Cl. 44-71.000.

Chiabrandy, Robert E., to General Electric Company. Balanced Gatling gun. 4,216,698, Cl. 89-12.000.

Chiba, Akio; Imahashi, Hiromichi; Tomita, Sadami; and Utsumi, Yoshiharu, to Hitachi, Ltd. Magnetic pole pieces for use in a nuclear magnetic resonance apparatus. 4,217,568, Cl. 335-298.000.

Childress, Evelyn O.: *See*—
Pope, George F.; and Childress, Evelyn O., 4,216,943, Cl. 256-10.000.

Chisholm, William M., to Western Electric Company, Inc. Methods of and apparatus for assembling articles with a support. 4,216,580, Cl. 29-842.000.

Chow, Ho, to Beatrice Foods Co. Speed slip-on hose coupler. 4,216,982, Cl. 285-315.000.

Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 6-Amido-3-substituted-amino-1-azabicyclo[3.2.0]hept-2-en-7-one-2-carboxylic acid. 4,217,453, Cl. 544-373.000.

Christian, Miles W., to Plymouth Locomotive Works, Inc. Extruder with sealing die for abrasive material. 4,217,086, Cl. 425-376.00R.

Christie, David A., to Phillips Petroleum Company. Catalyst regenerator control. 4,217,243, Cl. 252-419.000.

Christopher, Henry B.: *See*—
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., 4,217,383, Cl. 428-95.000.

Chu, Sungnee G.: *See*—
Li, James C. M.; and Chu, Sungnee G., 4,217,493, Cl. 250-272.000.
Ciba-Geigy AG: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, 4,217,304, Cl. 260-508.000.
Ciba-Geigy Corporation: *See*—
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,217,350, Cl. 424-250.000.
Kelemen, Jozsef; Kuhl, Eickhard; and Schmid, Karl, 4,217,239, Cl. 252-301.170.
Michaelis, Peter, 4,217,233, Cl. 252-48.200.
Puck, Alfred, 4,217,158, Cl. 156-156.000.
Schutz, Hans U., 4,217,270, Cl. 260-145.00B.
Siegrist, Adolf E.; and Coviello, Vincenzo, 4,217,301, Cl. 260-465.00G.
Cilesio, Robert: *See*—
Flaceliere, Bernard; and Cilesio, Robert, 4,216,719, Cl. 101-227.000.
CISE - Centro Informazioni Studi Esperienze S.p.A.: *See*—
Fiorito, Giancarlo; Gasparrini, Guido; and Svelto, Francesco, 4,217,490, Cl. 250-211.00J.
Ciszek, Theodore F.: *See*—
United States of America, National Aeronautics and Space Administration; and Ciszek, Theodore F., 4,217,165, Cl. 156-601.000.
Citizen Watch Company Limited: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,217,654, Cl. 364-705.000.
Ichikawa, Singo; Ishida, Fujio; and Kawashima, Hideyuki, 4,216,649, Cl. 368-109.000.
Citterio, Attilio: *See*—
Maggioni, Paolo; Mauri, Francesco; and Citterio, Attilio, 4,217,290, Cl. 260-404.000.
Clare, Richard D.; and Sontheimer, Carl G., to Cuisinarts, Inc. Safety interlock for the food pusher in a food processor. 4,216,917, Cl. 241-37.500.
Clark, K. Warren: *See*—
Witzel, Frank; Mackay, Donald A. M.; Bakal, Abraham I.; and Clark, K. Warren, 4,217,368, Cl. 426-5.000.
Clark, Peter D., to Sunworks, Inc. Solar energy collector system including apparatus for balancing heat-exchange fluid flow. 4,216,764, Cl. 126-448.000.
Clayton, John P.: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,447, Cl. 542-426.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,448, Cl. 542-427.000.
Clayton Manufacturing Company: *See*—
Asmus, Carl J., 4,216,710, Cl. 98-115.00R.
Clifford, Jack R. Implement for cleaning box culverts. 4,216,561, Cl. 15-104.30R.
Clopay Corporation: *See*—
Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., 4,217,327, Cl. 264-293.000.
Clorox Company, The: *See*—
Basile, Peter A.; Bochmann, Carl E.; and Halbeisen, Jack, 4,216,882, Cl. 222-207.000.
Coakley, Kim L.: *See*—
Cobb, Clyde E.; and Coakley, Kim L., 4,216,795, Cl. 137-554.000.
Cobb, Clyde E.; and Coakley, Kim L., to Textron, Inc. Position feedback attachment. 4,216,795, Cl. 137-554.000.
Coca-Cola Company, The: *See*—
Sedam, Jason K., 4,216,885, Cl. 222-481.000.
Coffen, David L.: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,217,363, Cl. 424-320.000.
Cohen, Jean-Pierre D., to Societe Anonyme de Telecommunications. Process and device for the instantaneous display of a countryside scanned by a camera of the single line scanning type. 4,217,607, Cl. 358-109.000.
Cohen, Robert E. Magnetically unlocked pet door. 4,216,743, Cl. 119-19.000.
Colby, Daniel E., to McCord Corporation. Method using modular slush molding machine. 4,217,325, Cl. 264-245.000.
Cole, John W., to Abbott Laboratories. Dipeptide chromogenic substrates. 4,217,269, Cl. 260-112.50R.
Cole, Loren. Vehicle battery polarity indicator. 4,217,534, Cl. 320-25.000.
Coleco Industries, Inc.: *See*—
Schaub, Charles T., 4,217,331, Cl. 422-265.000.
Tscherner, Georg W., 4,216,798, Cl. 137-625.290.
Colgate Palmolive Company: *See*—
Gaffar, Abdul; and Gaffar, Maria C. S., 4,217,342, Cl. 424-48.000.
Gaffar, Abdul; and Gaffar, Maria C. S., 4,217,343, Cl. 424-48.000.
Collura, Peter C.; and Humphries, Richard L., to Kliklok Corporation. Lock for a corner lock carton. 4,216,897, Cl. 229-35.000.
Columbia Ribbon and Carbon Mfg. Co., Inc.: *See*—
Scott, Michael A.; Brown, Albert E.; and Young, Edward, 4,217,388, Cl. 428-307.000.
Cominco Ltd.: *See*—
Kerby, Robert C., 4,217,189, Cl. 204-119.000.
Commissariat a l'Energie Atomique: *See*—
Robin, Marcel, 4,216,821, Cl. 165-11.00R.
Commonwealth Scientific and Industrial Research Organization: *See*—
Wild, John P.; and Poulton, Geoffrey T., 4,217,590, Cl. 343-754.000.
Compagnie Generale de Radiologie: *See*—
Bombray, Marcel; and Caugant, Jean, 4,217,500, Cl. 250-469.000.
Delair, Jacques; and Le Guen, Jacques, 4,217,517, Cl. 313-56.000.
Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Petit, Andre; and Jamet, Daniel, 4,217,023, Cl. 339-121.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme): *See*—
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,216,577, Cl. 29-831.000.
Giraud, Georges M., 4,217,572, Cl. 340-147.0SY.
Condon, Michael E.: *See*—
Ondetti, Miguel A.; and Condon, Michael E., 4,217,458, Cl. 546-326.000.
Coney, Joseph J.: *See*—
Reich, Harry; and Coney, Joseph J., 4,217,143, Cl. 106-100.000.
Congoleum Corporation: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,217,385, Cl. 428-159.000.
Cooper, John S.: *See*—
Alexander, William J., III; and Cooper, John S., 4,216,804, Cl. 139-311.000.
Cooper, Roy G.: *See*—
Leary, David F.; Cooper, Roy G.; and Miertschin, Gary N., 4,217,174, Cl. 176-82.000.
Copeland, Gaeta L.: *See*—
Szabat, John F.; Baumann, Gert F.; and Copeland, Gaeta L., 4,217,247, Cl. 252-431.00C.
Corajoud, Jean-Michel: *See*—
Doniat, Denis; Corajoud, Jean-Michel; Mosetti, Jacques; and Porta, Augusto, 4,217,191, Cl. 204-130.000.
Corbellini, Margherita; Gamba, Alessandro; and Busetto, Carlo, to Snamprogetti, S.p.A. Chemical compositions based on titanium trihalides, method for their preparation and their uses. 4,217,245, Cl. 252-429.00B.
Cordell, Jack R. Tower. 4,216,636, Cl. 52-637.000.
Cormany, Charles L., to PPG Industries, Inc. Stabilization of cyclohexene oxide. 4,217,310, Cl. 260-652.50R.
Cornelius Company, The: *See*—
McMillin, John R., 4,216,879, Cl. 222-1.000.
Coscia, Anthony T.; Panzer, Hans P.; and O'Connor Michael N. D., to American Cyanamid Company. Preparation of a cationic copolymer. 4,217,262, Cl. 260-29.6SQ.
Coscia, Anthony T.: *See*—
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,215, Cl. 210-54.000.
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,443, Cl. 528-373.000.
Cosentino, Louis S.: *See*—
Catanese, Carmen A.; and Cosentino, Louis S., 4,217,519, Cl. 313-411.000.
Coster Tecnologie Speciali S.p.A.: *See*—
Giuffredi, Giancarlo, 4,216,884, Cl. 222-402.160.
Cottingham, Hugh V., to Inverness International Corporation. Electrolysis hair removal apparatus. 4,216,775, Cl. 128-303.180.
Cotton, John K.: *See*—
Aldridge, Lionel D.; and Cotton, John K., 4,217,024, Cl. 339-275.00T.
Coviello, Vincenzo: *See*—
Siegrist, Adolf E.; and Coviello, Vincenzo, 4,217,301, Cl. 260-465.00G.
CPC International Inc.: *See*—
Walon, Raoul, 4,217,413, Cl. 435-94.000.
Walon, Raoul G. P., 4,217,414, Cl. 435-95.000.
Cramer, Milton A. Portable scaffold support base. 4,216,933, Cl. 248-188.500.
Crane, Theodore H., to BioMass Fuel Conversion Associates, Inc. Pressurized treatment of sewage. 4,217,211, Cl. 210-7.000.
Cross, Joseph E., to Litton Systems, Inc. Semi-additive process of manufacturing a printed circuit. 4,217,182, Cl. 204-15.000.
Cross, Peter E.; and Dickinson, Roger P., to Pfizer Inc. Inhibition of thromboxane synthetase with 3-(imidazol-1-ylalkyl)indoles. 4,217,357, Cl. 424-273.00R.
Crounse, Nathan N., to Sterling Drug Inc. Novel monoazo and disazo colorants from aminoalkylanilines and bis(aminoalkyl)anilines. 4,217,272, Cl. 260-163.000.
Crowe, John E.: *See*—
Bardos, Peter A.; and Crowe, John E., 4,217,632, Cl. 363-26.000.
Crowe, Talmadge L. Fluid pressure set and released well packer apparatus. 4,216,827, Cl. 166-120.000.
Crowley, Helen E. Combination safety and heat conservation panel. 4,217,094, Cl. 432-65.000.
Crown Controls Corporation: *See*—
Leasor, Paul J.; Pulskamp, Gerald S.; and Stammen, Harold A., 4,217,074, Cl. 414-642.000.
Crum, McDonald, to Leggett & Platt, Incorporated. Unitized close-to-the-wall recliner chair mechanism. 4,216,992, Cl. 297-85.000.
Cucinella, Salvatore: *See*—
Dozzi, Giovanni; and Cucinella, Salvatore, 4,217,246, Cl. 252-429.00B.
Cuisinarts, Inc.: *See*—
Clare, Richard D.; and Sontheimer, Carl G., 4,216,917, Cl. 241-37.500.
Cullis, Herbert M.; and Dorsey, Evelyn E., to Baxter Travenol Laboratories, Inc. Sickle cell therapeutic treatment. 4,216,770, Cl. 128-214.00R.
Cunningham, Emmett M., to Plastics, Inc. Portable turntable for microwave oven. 4,216,727, Cl. 108-20.000.

Cunningham, Hugh, to PPG Industries, Inc. Electrolytic cell. 4,217,199, Cl. 204-256.000.

Curatola, Edward R. Striking bag exercise structure. 4,216,957, Cl. 272-78.000.

Cyphert, Gilbert G., to Chemko Industries, Inc. Combined dry and wet carpet cleaner. 4,216,563, Cl. 15-321.000.

Czerwinski, Watson P., to United States of America, Army. High frequency roll-bar loop antenna. 4,217,591, Cl. 343-713.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Children's lunch box. 4,216,862, Cl. 206-541.000.

Dahl, Ernest A.: *See*—
Barry, George H.; and Dahl, Ernest A., 4,217,645, Cl. 364-483.000.

Dahm, Jan. System or the accurate positioning of an apparatus along a path of movement by means of a digital position reader unit. 4,217,530, Cl. 318-623.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Inoue, Eiichi; and Takeda, Misturu, 4,217,409, Cl. 430-346.000.

Dalley, Robert J.; and Owen, Robert D., to Sangamo Weston, Inc. Voltage and current sources. 4,217,634, Cl. 363-89.000.

Daly, Robert E.: *See*—
Gacki, Leonard W.; and Daly, Robert E., 4,217,054, Cl. 366-150.000.

Dam, Naim G.; Picunko, Thomas; and Kramer, Henry H., to Bios Inc. Method and apparatus for locating data characterizing blood flow through the heart. 4,217,642, Cl. 364-416.000.

Daniel, Jean-Claude; and Jorio, Nadine, to Rhone-Poulenc Industries. Latices of vinyl polymers which are stable in electrolytes. 4,217,260, Cl. 260-29.60H.

Daniels, Charles J.; and Silberberg, Jeffrey L., to United States of America, Health, Education and Welfare. Portable instrument for measuring neutron energy spectra and neutron dose in a mixed n-γ field. 4,217,496, Cl. 250-369.000.

Daniels, Charles J.; and Silberberg, Jeffrey L., to United States of America, Health, Education and Welfare. Portable instrument for measuring neutron energy spectra and neutron dose in a mixed n-γ field. 4,217,497, Cl. 250-369.000.

Daniels, Dennis. Line retrieving and dispensing device. 4,216,602, Cl. 43-18.00R.

Darlington, Douglas K.: *See*—
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,216,630, Cl. 51-170.00T.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M., 4,216,862, Cl. 206-541.000.

Dastur, Khurshid P., to Firmenich SA. Novel cyclopentanone derivatives used as perfume ingredients. 4,217,251, Cl. 252-522.00R.

Data Recording Instruments Limited: *See*—
Ridgway, Peter C.; and Case, Derek F., 4,217,168, Cl. 430-320.000.

Datron Electronics Limited: *See*—
Pickering, John R., 4,217,651, Cl. 364-571.000.

Daumy, Gaston O., to Pfizer, Inc. Biotransformation preparation of 2,3-dihydroxybenzoic acid. 4,217,416, Cl. 435-146.000.

d'Auria, Luigi; de Crenoux, Baudoin; and Jacques, Andre, to Thomson-CSF. Electroluminescent photodetector diode and busbar lines using said diode. 4,217,598, Cl. 357-19.000.

Davies, Robert W., to Molins Limited. Cigarette packets. 4,216,898, Cl. 229-44.0CB.

Davis, Noel: *See*—
Haub, John T.; Krassas, James G.; Rustad, Stanley C.; and Davis, Noel, 4,216,618, Cl. 47-65.000.

Davis, Stephen H., to Water Refining Company, Inc. Water softener cabinet. 4,217,011, Cl. 312-237.000.

Davison, Richard R.; and Harris, William B. Pre-vaporizing fuel system. 4,216,751, Cl. 123-523.000.

Dawson, Robert H.: *See*—
Carnes, James E.; Dawson, Robert H.; and Kosonocky, Walter F., 4,217,605, Cl. 358-31.000.

Day, Raymond A.: *See*—
Volgstadt, Frank R.; Reschke, Albert H.; Passerell, David P.; and Day, Raymond A., 4,216,793, Cl. 137-318.000.

Dayco Corporation: *See*—
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,216,679, Cl. 474-238.000.
Meek, Lennis E., 4,217,324, Cl. 264-236.000.

De La Rue Giori S.A.: *See*—
Kwasnitza, Hans-Dieter, 4,216,954, Cl. 271-283.000.

De Pruines ISECO S.A.: *See*—
Bellavoine, Robert, 4,217,476, Cl. 219-10.55E.

Deal, Troy M. Method of pumping and processing phosphate slime for land reclamation. 4,217,212, Cl. 210-19.000.

Decouzon, Georges, to Regie Nationale des Usines Renault. Anti-gurgle apparatus for a power-steering valve. 4,216,842, Cl. 180-146.000.

de Crenoux, Baudoin: *See*—
d'Auria, Luigi; de Crenoux, Baudoin; and Jacques, Andre, 4,217,598, Cl. 357-19.000.

Dederick, Robert J. Collapsible bag with enlargable opening. 4,216,900, Cl. 229-55.000.

Deere & Company: *See*—
Schafer, Richard A., 4,216,975, Cl. 280-461.00A.

DeGaeta, Albert M. Method and apparatus for producing balls. 4,216,629, Cl. 51-125.000.

Degraeve, Francois R.; Divay, Rene G.; and Lecoeur, Jean-Pierre E., to Albaret S.A. Compacting apparatus for road surfacing material. 4,216,838, Cl. 180-14.00R.

Dehnert, Douglas K., to Arctic Enterprises, Inc. Drive belt assembly for snowmobiles. 4,217,006, Cl. 305-35.0EB.

DEK Printing Machine Limited: *See*—
Hall, Charles E.; and Moore, Royston, 4,216,717, Cl. 101-123.000.

DeKeersmaecker, Roger F.; DiMaria, Donelli J.; and Young, Donald R., to International Business Machines Corporation. Non-volatile memory devices fabricated from graded or stepped energy band gap insulator MIM or MIS structure. 4,217,601, Cl. 357-54.000.

Del Mar Avionics: *See*—
Squires, W. David; Anderson, Donald L.; and Cherry, Isaac R., 4,216,779, Cl. 128-682.000.

Delair, Jacques; and Le Guen, Jacques, to Compagnie Generale de Radiologie. Small divergence x-ray tube. 4,217,517, Cl. 313-56.000.

DeLuca, Hector F.; Schnoes, Heinrich K.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Anti-vitamin D compounds. 4,217,288, Cl. 260-397.200.

Deminet, Czeslaw, to Boeing Company, The. Transparent solar heat collector. 4,216,765, Cl. 126-449.000.

Dennison Manufacturing Company: *See*—
Magnotta, Frank A., 4,217,263, Cl. 260-29.800.

DeRossi, John D.: *See*—
Sekmakas, Kazys; Shah, Raj; and DeRossi, John D., 4,217,261, Cl. 260-29.6NR.

DeSelms, Dean B. Back for picture frame. 4,216,936, Cl. 248-460.000.

DeSoto, Inc.: *See*—
Sekmakas, Kazys; Shah, Raj; and DeRossi, John D., 4,217,261, Cl. 260-29.6NR.

Detinko, Felix M.; Dukshtau, Alexandr A.; and Pinsky, Grigory B. Vibration damping stator structure for a hydrogenerator. 4,217,510, Cl. 310-51.000.

Detjen, Edgar W. Dual flush system. 4,216,555, Cl. 4-324.000.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Goedecke, Ralf; Kurandt, Uwe; and Moller, Rolf, 4,217,451, Cl. 544-190.000.
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,217,334, Cl. 423-342.000.

Devienne, Andre M.: *See*—
Grosch, Karl A.; Mirtain, Henri J.; Devienne, Andre M.; and Trzepacz, Jean, 4,216,814, Cl. 152-362.00R.

Devlin, Barry R. J.: *See*—
Mason, Ronald F.; and Devlin, Barry R. J., 4,217,283, Cl. 260-326.50B.

Diamond, Edward J. Appliance for use with dispensing nozzles. 4,216,807, Cl. 141-392.000.

Diamond Shamrock (Polymers) Limited: *See*—
Smith, Robert L., 4,217,417, Cl. 435-180.000.

Diana, Guy D., to Sterling Drug Inc. Arylalkyl and aryloxyalkyl phosphonates as antiviral agents. 4,217,346, Cl. 424-214.000.

Dick, Virgil. High clearance vehicle drive arrangement. 4,216,840, Cl. 180-70.00R.

Dickinson, George A., to Pilkington Brothers Limited. Method and apparatus for manufacturing flat glass on a molten metal bath. 4,217,125, Cl. 65-99.00A.

Dickinson, Roger P.: *See*—
Cross, Peter E.; and Dickinson, Roger P., 4,217,357, Cl. 424-273.00R.

Dickover, William: *See*—
Passafiume, Anthony; Lamber, Clarence F.; and Dickover, William, 4,216,687, Cl. 83-26.000.

Didde-Glaser, Incorporated: *See*—
Gaston, Harold W.; Welborn, Ronald D.; and Humphreys, Samuel G., 4,216,718, Cl. 101-144.000.

Diepal Corporation: *See*—
Machuque, Jean H. J., 4,217,083, Cl. 425-198.000.

Dietch, Leonard; and Schwartz, James W., to Zenith Radio Corporation. High potential static discharge means for television cathode ray tubes. 4,217,521, Cl. 313-479.000.

Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, to Hoechst Aktiengesellschaft. Pigment preparations. 4,217,265, Cl. 260-42.210.

Diffracto Ltd.: *See*—
Pryor, Timothy R.; and Hageniers, Omer L., 4,216,837, Cl. 177-1.000.

Dillon, Leo H.: *See*—
Born, Ellis H.; Wolfe, Paul B.; and Dillon, Leo H., 4,216,699, Cl. 91-3.000.

DiMarco, Bernard: *See*—
Gryctko, Carl E.; DiMarco, Bernard; and Kralik, Andrew J., 4,217,472, Cl. 200-144.00R.

DiMaria, Donelli J.: *See*—
DeKeersmaecker, Roger F.; DiMaria, Donelli J.; and Young, Donald R., 4,217,601, Cl. 357-54.000.

Dinkelbach, Anton; and Weber, Karl-Heinz, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Control circuit for underground mining equipment. 4,217,622, Cl. 361-175.000.

Display Corporation International: *See*—
Sturm, Michael R., 4,216,867, Cl. 211-77.000.

Divay, Rene G.: *See*—
Degraeve, Francois R.; Divay, Rene G.; and Lecoeur, Jean-Pierre E., 4,216,838, Cl. 180-14.00R.

Diversified Manufacturing & Marketing Co., Inc.: *See*—
Pope, George F.; and Childress, Evelyn O., 4,216,943, Cl. 256-10.000.

Dmitrievsky, Anatoly V.; Kamenev, Vladimir F.; Pashin, Jury M.; Prudov, Nikolai M.; Simatov, Alexandr I.; Tjufyakov, Andrei S.; Shishkin, Jury N.; and Yamolov, Jury I. Device for reducing noxious emissions from carburetor internal combustion engines. 4,217,313, Cl. 261-41.00D.

Dob, Allan M.: *See*—
Marsh, Walter H.; Beckerman, Howard L.; and Dob, Allan M., 4,216,732, Cl. 112-158.00B.

Dobo, Emerick J., to Monsanto Company. Sintered bi-metallic conjugate filaments and their preparation. 4,217,399, Cl. 428-679.000.

Dobson, Rodney J.: *See*—
Rod, Robert L.; Penick, Walter J.; and Dobson, Rodney J., 4,217,402, Cl. 429-111.000.

Dr. Th. Bohme, Chem. Fabrik GmbH & Co.: *See*—
Graf, Hans-Dieter, 4,217,104, Cl. 8-94.140.

Doi, Ryota: *See*—
Simazaki, Yuzuru; Doi, Ryota; Kumagai, Yuji; Fukazawa, Ikou; and Yamaguchi, Motoo, 4,217,514, Cl. 310-260.000.

Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., to International Harvester Company. Unitized face type seal. 4,216,972, Cl. 277-39.000.

Donahue, Robert J.: *See*—
Sawyer, Robert E., Jr.; and Donahue, Robert J., 4,217,506, Cl. 307-360.000.

Donermeyer, Donald D.; and Martins, Joseph G., to Monsanto Company. Cavity filling with a hot melt adhesive composition. 4,217,376, Cl. 427-142.000.

Doniat, Denis; Corajoud, Jean-Michel; Mosetti, Jacques; and Porta, Augusto, to Battelle Memorial Institute. Process for regenerating contaminated activated carbon. 4,217,191, Cl. 204-130.000.

Doniger, Jerry: *See*—
Tawfik, David A.; Doniger, Jerry; and Porawski, Donald J., 4,217,486, Cl. 371-68.000.

Donnard, Reed E.: *See*—
Marziano, Samuel J.; and Donnard, Reed E., 4,216,721, Cl. 102-90.000.

Dooley, James L.: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,216,745, Cl. 123-26.000.

Doone, Robert G.: *See*—
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., 4,217,383, Cl. 428-95.000.

Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., to BBC Brown, Boveri & Company, Limited. Liquid crystal display. 4,217,035, Cl. 350-338.000.

Dorlars, Alfons; and Neuner, Otto, to Bayer Aktiengesellschaft. Process for the preparation of bis-triazolylstilbenes. 4,217,449, Cl. 542-462.000.

Dorn, Conrad P.: *See*—
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,217,352, Cl. 424-256.000.

Dorsey, Evelyn E.: *See*—
Cullis, Herbert M.; and Dorsey, Evelyn E., 4,216,770, Cl. 128-214.00R.

Douglas, Robert H.: *See*—
Handly, Robert J.; and Douglas, Robert H., 4,217,657, Cl. 364-748.000.

Doundoulakis, George J. Digitizer for locating the position of a stylus point on a writing surface. 4,217,649, Cl. 364-556.000.

Dow Chemical Company, The: *See*—
Kyriacou, Demetrios; Edamura, Fred Y.; and Love, Jim, 4,217,185, Cl. 204-73.00R.
Wasilczyk, George J., 4,217,422, Cl. 521-122.000.
Wentzler, Thomas H., 4,217,208, Cl. 209-18.000.

Downie, David E.; Harvey, Robert J.; and Rueff, John R., to Thoratec Laboratories Corporation. Disposable aortic perforator. 4,216,776, Cl. 128-305.000.

Doyle, Ronald J.: *See*—
Suddick, Richard P.; Staat, Robert H.; and Doyle, Ronald J., 4,217,341, Cl. 424-48.000.

Dozzi, Giovanni; and Cucinella, Salvatore, to Anic, S.p.A. Method for the hydrogenation of aromatic substrates and means therefor. 4,217,246, Cl. 252-429.00B.

Drake, Charles A., to Phillips Petroleum Company. Preparation of unsaturated nitriles. 4,217,303, Cl. 260-465.80R.

Drelichowski, Marek K. Collapsible spout for dispensing fluent materials. 4,216,880, Cl. 222-83.000.

Dren, Anthony T.; and Bopp, Barbara A., to Abbott Laboratories. Benzopyrano quinuclidines useful as antiglaucoma agents. 4,217,351, Cl. 424-256.000.

Dresser Europe, S.A.: *See*—
Butcher, Alan G.; and Wong, Chan-Po, 4,216,674, Cl. 73-861.010.

Drewitz, Hans-Jurgen: *See*—
Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, 4,216,684, Cl. 74-751.000.

Droghini, Roberto D.: *See*—
Lim, Gary M. F.; and Droghini, Roberto D., 4,217,275, Cl. 260-239.100.

Dronet, Jean M.: *See*—
Utzmann, Rene; and Dronet, Jean M., 4,217,163, Cl. 156-361.000.

Dubin, Paul L., to Dynapol. High molecular weight polyvinylamine hydrochloride as flocculant. 4,217,214, Cl. 210-52.000.

Dudley, Robert G. Whole fruit size grader. 4,216,865, Cl. 209-539.000.

Dufford, Max H., Jr.; and Price, Earl T., to Nolan Systems Inc. Counting system for articles conveyed in a stream. 4,217,491, Cl. 250-223.00R.

Dukshtau, Alexandr A.: *See*—
Detinko, Felix M.; Dukshtau, Alexandr A.; and Pinsky, Grigory B., 4,217,510, Cl. 310-51.000.

Dunkel, Gerd: *See*—
Lagodka, Gunter; Rosenberg, Harry; Becker, Kunibert; and Dunkel, Gerd, 4,217,067, Cl. 405-296.000.

Dunlop Limited: *See*—
Bourne, Alan J., 4,216,812, Cl. 152-330.00L.
Moring, Peter L. E.; and Biggs, Ian, 4,216,856, Cl. 198-847.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, John B., Jr., 4,217,293, Cl. 260-429.00K.
Bayless, John H., 4,217,441, Cl. 528-293.000.
Bergna, Horacio E., 4,217,240, Cl. 252-313.00S.
Sauers, Richard F., 4,217,312, Cl. 260-941.000.
Smith, Dewey H., Jr., 4,217,353, Cl. 424-260.000.
Starkweather, Howard W., Jr.; and Mutz, Michael J., 4,217,430, Cl. 525-183.000.

Duro-Test Corporation: *See*—
Strauss, Herbert S., 4,217,522, Cl. 315-73.000.

Durst, Jack R., to Pillsbury Company, The. Moisture resistant nut-like food composition. 4,217,369, Cl. 426-98.000.

Dusil, Richard: *See*—
Whike, Alan S.; and Dusil, Richard, 4,217,090, Cl. 432-8.000.
Whike, Alan S.; and Dusil, Richard, 4,217,091, Cl. 432-8.000.

Dutro, Lyle V. Vendor for flat articles and method of vending said articles. 4,216,877, Cl. 221-213.000.

Duykers, Ludwig R.; and Percy, Joseph L., to United States of America, Navy. Treatment of body tissue by means of internal cavity resonance. 4,216,766, Cl. 128-773.000.

Dyball, Christopher J., to Pennwalt Corporation. Diethylene glycol bis(allyl carbonate) compositions containing crosslinkable copolymers. 4,217,433, Cl. 525-277.000.

Dynapol: *See*—
Dubin, Paul L., 4,217,214, Cl. 210-52.000.

Dysarz, Dennis R., to General Motors Corporation. Carburetor and method of operation. 4,217,314, Cl. 261-50.00R.

E. R. Squibb & Sons, Inc.: *See*—
Haugwitz, Rudiger D., 4,217,358, Cl. 424-274.000.
Horovitz, Zola P.; and Rubin, Bernard, 4,217,347, Cl. 424-246.000.
Krapcho, John, 4,217,359, Cl. 424-274.000.
Ondetti, Miguel A.; and Condon, Michael E., 4,217,458, Cl. 546-326.000.
Treuner, Uwe D.; and Breuer, Hermann, 4,217,348, Cl. 424-246.000.

Eastman Kodak Company: *See*—
Barkey, Kenneth T., 4,217,440, Cl. 528-274.000.
McConnell, Richard L.; and Weemes, Doyle A., 4,217,426, Cl. 525-173.000.
McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,217,428, Cl. 525-191.000.
McConnell, Richard L.; and Weemes, Doyle A., 4,217,435, Cl. 525-425.000.

Eaton Corporation: *See*—
Bonnes, Eugene D.; Kotian, Vijayraj M.; and MenMuir, Paul C., 4,216,802, Cl. 138-143.000.
Geppert, Steven, 4,216,868, Cl. 212-155.000.
Jalbert, Bernard W.; Skulley, Gerald W.; and Wahl, James A., 4,216,847, Cl. 187-9.00R.

Eaton Yale Ltd.: *See*—
Brundidge, Clayton L.; and Bechman, William H., 4,216,702, Cl. 91-436.000.

Ebauches SA: *See*—
Maire, Bernard, 4,216,648, Cl. 368-66.000.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Company Limited. Portable electronic device equipped with timekeeping and calculation functions. 4,217,654, Cl. 364-705.000.

Ebskamp, Hermanus J. G. Method for improving the structural properties of fats. 4,217,372, Cl. 426-603.000.

Eckert, Ronald P., to Thomas A. Schutz Co., Inc. Adjustable alphabetic or numeric display device. 4,216,599, Cl. 40-451.000.

Ecklund, Richard C.: *See*—
Hayase, Masashi; Ecklund, Richard C.; Walkington, Robert J.; Hughes, James B.; and Williams, Neil R., 4,217,397, Cl. 428-594.000.

Edamura, Fred Y.: *See*—
Kyriacou, Demetrios; Edamura, Fred Y.; and Love, Jim, 4,217,185, Cl. 204-73.00R.

Edelman, Alfred E. Angulation head for dental implant and bending tool for same. 4,217,100, Cl. 433-176.000.

EDV-Druck Walter Schnug KG: *See*—
Schnug, Lieselotte, 4,217,384, Cl. 428-138.000.

Edwards, Bryant: *See*—
Olsen, Robert C.; and Edwards, Bryant, 4,216,621, Cl. 47-73.000.

Egawa, Mitsuo: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, 4,217,366, Cl. 424-330.000.

Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Viewfinder capable of adjusting diopter. 4,217,048, Cl. 354-155.000.

Egawa, Takeshi: *See*—
Yamazaki, Keiji; Egawa, Takeshi; Yamazaki, Yasuo; and Ueda, Hiroshi, 4,217,044, Cl. 354-54.000.

Egli, Rene; Staub, Hans-Rudolf; and Feneberger, Kurt, to Lonza Ltd. Rotary filter. 4,217,220, Cl. 210-79.000.

Egloff, Markus: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,217,035, Cl. 350-338.000.

Eguchi, Chikahiko: *See*—
Yasuda, Naohiko; Eguchi, Chikahiko; Okutsu, Masaru; and Hirose, Yoshiteru, 4,217,450, Cl. 544-25.000.

Eguchi, Seiji: *See*—
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,217,638, Cl. 364-200.000.

Ehrhart, Philip J.: *See*—
Koch, Earl E.; and Ehrhart, Philip J., 4,216,641, Cl. 56-14.400.

Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. Oxygenated N-aryl-diazacyclic compounds. 4,217,350, Cl. 424-250.000.

Eichinger, Johann: *See*—
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,216,737, Cl. 440-61.000.

Eiland, P. Frank; and Jacobs, David R., to Spanel, Abram N. Tapered key coupling. 4,217,061, Cl. 403-313.000.

Ekstrom, Lincoln: *See*—
Wang, Chih C.; Ekstrom, Lincoln; and Wielicki, Henry, 4,216,970, Cl. 274-42.00R.

Electro-Catheter Corporation: *See*—
Heimann, Lester, 4,216,860, Cl. 206-370.000.

Electro-Therm, Inc.: *See*—
Vogel, Alan D.; and Snyder, Fred E., 4,217,483, Cl. 219-541.000.

Electronic Associates, Inc.: *See*—
Klaus, John F.; and Liotta, F. James, 4,217,652, Cl. 364-601.000.

Elfab Corporation: *See*—
Ammon, J. Preston; and Weaver, Harry R., 4,216,576, Cl. 29-845.000.

Elfert, Klaus; Wolf, Gerhard D.; Bentz, Francis; and Kunzel, Hans E., to Bayer Aktiengesellschaft. Semipermeable membranes of copolyamides. 4,217,227, Cl. 210-500.00M.

Elger, Walter: *See*—
Vorbrueggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,217,360, Cl. 424-278.000.

Ellefson, Jerry K.; and Johnson, David E., to Gates Rubber Company, The. Hanger for displaying hose or the like. 4,216,935, Cl. 248-360.000.

Ellis, Peter M.; and Gibb, Robert D., to Imperial Chemical Industries Limited. Laying oriented fibrous webs. 4,217,159, Cl. 156-177.000.

Elopak A/S: *See*—
Slungaard, Svein; Frydendal, Tom; and Skjelby, Finn, 4,217,156, Cl. 156-69.000.

Elpan ApS: *See*—
Keldmann, Erik C. V., 4,216,823, Cl. 165-55.000.

Ely, Robert G. Safety shackle. 4,216,987, Cl. 294-83.00R.

Empire Automotive, Inc.: *See*—
Hough, Louis E.; and Shifflett, David C., 4,216,983, Cl. 292-263.000.

En, John, to Motorola, Inc. Method and apparatus for the coding and decoding of digital data. 4,217,660, Cl. 371-44.000.

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Endo Laboratories, Inc.: *See*—
Berger, Joel G., 4,217,454, Cl. 546-50.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,217,374, Cl. 427-39.000.

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Hindin, Saul G.; and Roberts, George W., 4,217,332, Cl. 423-249.000.

Entenman, Alan, to Intech Laboratories, Inc. Phase modulated data transmission system. 4,217,551, Cl. 375-88.000.

Envirotech Corporation: *See*—
Fismer, William L.; and Beach, William A., 4,217,224, Cl. 210-231.000.

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Erickson, William V.; Jarvie, Paul K.; and Miller, Fred L., to Miller, Fred Lynn. Water pipe or bong. 4,216,785, Cl. 131-173.000.

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Kahmann, Albrecht; and Siewert, Wolfgang, 4,216,918, Cl. 241-46.00B.

Escher Wyss Limited: *See*—
Kampeen, Yves; Hoppe, Bernd; and Rebsamen, Ernst, 4,217,226, Cl. 210-376.000.

Espy, Calvin L. Horticulture device for rotating plants due to transpiration and evaporation of moisture. 4,216,619, Cl. 47-67.000.

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Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, 4,217,280, Cl. 260-239.570.

Evans, John C., Jr., to United States of America, National Aeronautics and Space Administration. Solar cell system having alternating current output. 4,217,633, Cl. 363-27.000.

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Extruded Metals: *See*—
Wu, Hsiao, 4,216,666, Cl. 72-256.000.

Exxon Research & Engineering Co.: *See*—
McVicker, Gary B., 4,217,249, Cl. 252-466.0PT.
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., 4,217,383, Cl. 428-95.000.
Ryan, Douglas G., 4,217,203, Cl. 208-35.000.
Sartori, Guido; and Savage, David W., 4,217,236, Cl. 252-189.000.
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Ezis, Andre; and Nicholson, John M., to Ford Motor Company. Slip cast article manufacturing method. 4,217,320, Cl. 264-65.000.

Fahey, Thomas D.; and McGannon, George P., to McCallin Steel Storage Systems, Inc. Apparatus for racking sheet materials. 4,216,866, Cl. 211-1.500.

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Holland, Richard W., 4,217,020, Cl. 339-75.00M.

Falk, John C.; and Wyatt, James, to Borg-Warner Corporation. Polybutylene terephthalate-polystyrene copolymers. 4,217,427, Cl. 525-176.000.

Fancy, Thomas A.: *See*—
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., 4,217,617, Cl. 361-51.000.

Farah, Alfred E., to Sterling Drug Inc. Ketazocine anesthetic method of use. 4,217,354, Cl. 424-267.000.

Farley, Cheryl; and Farley, Ira P. Psychotherapeutic testing game. 4,216,594, Cl. 35-22.00R.

Farley, Ira P.: *See*—
Farley, Cheryl; and Farley, Ira P., 4,216,594, Cl. 35-22.00R.

Farr, James B., to Tecumseh Products Company. D.C. Motor speed controller. 4,217,526, Cl. 318-139.000.

Farris, Richard C.; and Butler, William S., to Halliburton Company. Method of assembling a shock absorber employing a coil spring. 4,216,570, Cl. 29-434.000.

Faulkner, Trevor L.; and Hall, Barry M., to International Computers Limited. Data processing unit with two clock speeds. 4,217,637, Cl. 364-200.000.

Fayfield, Robert W., to Banner Engineering Corp. Modular photoelectric switch. 4,217,492, Cl. 250-239.000.

Feagin, Roy C. Method of making a ceramic shell mold. 4,216,815, Cl. 164-26.000.

Feder, Joseph: *See*—
Tolbert, William R.; Feder, Joseph; Kuo, Mau-Jung; and Folkman, Moses J., 4,217,412, Cl. 435-68.000.

Feist, Wolfgang M., to Raytheon Company. Charge coupled device. 4,216,574, Cl. 29-578.000.

Fellowes Manufacturing Company: *See*—
Klaus, Gerald R., 4,217,012, Cl. 312-292.000.

Feneberger, Kurt: *See*—
Egli, Rene; Staub, Hans-Rudolf; and Feneberger, Kurt, 4,217,220, Cl. 210-79.000.

Ferris, Michael J., to Marvin Glass & Associates. Pop-up toy. 4,216,610, Cl. 46-44.000.

Fezatt, Peter W.; Harvey, James A.; and Harvey, Ronald A. Plow blade attachment. 4,216,833, Cl. 172-805.000.

Fiat Auto S.p.A.: *See*—
Filippa, Eugenio, 4,217,007, Cl. 308-36.200.

Fichter, Frederick L. Filter module with independent securing means for an outlet grille, and for a filter element behind the grille. 4,217,121, Cl. 55-478.000.

Fickenscher, Friedrich: *See*—
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,216,737, Cl. 440-61.000.

Fiebig, Horst, to Stichweh Verwaltungs-GmbH. Grab excavator with fixed jib. 4,216,997, Cl. 299-9.000.

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Fillion, Paul D.: *See*—
Suh, Nam P.; Fillion, Paul D.; and Lee, Sang H., 4,217,113, Cl. 51-309.000.

Filterwerk Mann & Hummel GmbH: *See*—
Kopf, Rudi; and Trefz, Walter, 4,217,118, Cl. 55-330.000.

Fiorito, Giancarlo; Gasparrini, Guido; and Svelto, Francesco, to CISE - Centro Informazioni Studi Esperienze S.p.A. Method for constructing multispectral infrared detectors. 4,217,490, Cl. 250-211.00J.

Firmenich SA: *See*—
Dastur, Khurshid P., 4,217,251, Cl. 252-522.00R.
Holzner, Gunter, 4,217,250, Cl. 252-522.00R.

Fischer, Karl. Cooking appliance with several electric cooking zones. 4,217,481, Cl. 219-450.000.

Fischer, Karl-Heinz; and Perkert, Rudolf, to Massey-Ferguson Services N.V. Center support for blade of earthmover. 4,217,063, Cl. 403-37.000.

Fishbein, William; and Rittenbach, Otto E., to United States of America, Army. Dual frequency Doppler radar. 4,217,585, Cl. 343-7.700.

Fisher & Paykel Limited: *See*—
Shacklock, Frank W., 4,216,663, Cl. 68-3.00R.

Fismer, William L.; and Beach, William A., to Envirotech Corporation. Filter plate. 4,217,224, Cl. 210-231.000.

Flaceliere, Bernard; and Cilesio, Robert, to Logabox. Printing machine paper drive. 4,216,719, Cl. 101-227.000.

Flemming, Stephen J. Boomerang. 4,216,962, Cl. 273-426.000.

Flexible Plastic Straw Corporation: *See*—
Aykanian, Ardashus A., 4,216,801, Cl. 138-121.000.

Flow Research, Inc.: *See*—
Olsen, John H.; Hurlburt, George H.; and Kapcsandy, Louis E., 4,216,906, Cl. 239-11.000.

FMC Corporation: *See*—
Berkowitz, Sidney, 4,217,296, Cl. 260-458.00R.

Foley, Thomas P.: *See*—
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,216,889, Cl. 226-118.000.

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Ford Motor Company: *See*—
Ezis, Andre; and Nicholson, John M., 4,217,320, Cl. 264-65.000.
Vong, Sandy T. S., 4,217,392, Cl. 428-432.000.
Fossard, Marcel, to Raskin S.A. Protecting device of a clamping means for a sheet-shaped material working machine. 4,217,068, Cl. 414-20.000.
Foster, Kenneth D.; and Arnold, Sara J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Laser emission from purely chemically generated vibrationally excited hydrogen bromide. 4,217,557, Cl. 331-94.50G.
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, to John Heathcoat & Company Limited. Heating and drawing of synthetic filaments. 4,217,323, Cl. 264-235.000.
Fotobio Holding AG: *See*—
Nikolaiski, Eckhard, 4,217,445, Cl. 536-4.000.
Fourre, Jacques; Soisy sous Montmorency: *See*—
Maire, Jacques; Fourre, Jacques; Soisy sous Montmorency; and Gervais, Jean P., 4,217,336, Cl. 423-448.000.
Fradenburgh, Evan A., to United Technologies Corporation. Helicopter. 4,216,924, Cl. 244-17.110.
Frank, Dieter: *See*—
Quittkat, Wolfram; and Frank, Dieter, 4,217,092, Cl. 432-14.000.
Frank, Eldon M. Loader device and method of mounting. 4,217,075, Cl. 414-686.000.
Fray, Derek J., to National Research Development Corporation. Determination of lithium, sensor therefor and method of making said sensor. 4,217,179, Cl. 204-1.00T.
Fredd, John V., to Otis Engineering Corporation. Flapper valve. 4,216,830, Cl. 166-319.000.
Freeny, Charles C., Jr., to Information Identification Company, Inc. Object monitoring method and apparatus. 4,217,588, Cl. 343-112.00D.
Freitag, Dieter: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,217,437, Cl. 528-171.000.
French, Roger F. Thermal system. 4,216,659, Cl. 62-186.000.
Frey, Hans: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, 4,217,304, Cl. 260-508.000.
Freyn, Fritz, to List, Hans. Cylinder head for an air-cooled internal combustion engine. 4,216,746, Cl. 123-41.690.
Friedl, Reiner; Zeus, Dieter; Widemann, Friedrich; and Hornfeck, Werner, to Webasto-Werk W. Baier GmbH & Co. Auxiliary heater for vehicles. 4,216,759, Cl. 126-110.00B.
Friedrich, Heinz G.; and Kennedy, James V., to NL Industries, Inc. Process of catalytic methanation. 4,217,295, Cl. 260-449.60M.
Fritz, William B.; and Hopkins, John R., to AMP Incorporated. Multipair cable having low crosstalk. 4,217,155, Cl. 156-55.000.
Frolov, Mikhail V.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Frost, Kenneth A., Jr., to Chevron Research Company. Fuel compositions containing dialkyl formamides. 4,217,111, Cl. 44-71.000.
Froutzis, Andrew. Drapery hanger. 4,216,564, Cl. 16-93.00D.
Frydendal, Tom: *See*—
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Fuchs, Otto: *See*—
Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, 4,217,265, Cl. 260-42.210.
Planker, Siegfried; Baessler, Konrad; and Fuchs, Otto, 4,217,307, Cl. 260-569.000.
Fuji Photo Film Co., Ltd.: *See*—
Aonuma, Masashi; and Tamai, Yasuo, 4,217,152, Cl. 148-108.000.
Kubotera, Kikuo; Mizuki, Eiichi; Kawano, Hideo; and Fujiwara, Tadahiro, 4,217,408, Cl. 430-205.000.
Nakamura, Kotaro; and Mitsui, Akio, 4,217,410, Cl. 430-546.000.
Watanabe, Masaru; Yoyama, Tadao; and Ohashi, Azusa, 4,217,407, Cl. 430-166.000.
Fuji Xerox Co. Ltd.: *See*—
Tanaka, Koichi; Kobayashi, Kenji; and Aonuma, Shigeo, 4,217,406, Cl. 430-137.000.
Fujii, Masayuki, to Nissan Motor Company, Limited. Hydropneumatic suspension system for vehicle with valve means for selectively keeping hydraulic fluid within gas cushion. 4,216,977, Cl. 280-707.000.
Fujii, Yoshihisa: *See*—
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,217,548, Cl. 324-220.000.
Fujiike, Yoshitaka: *See*—
Tomita, Kazumi; and Fujiike, Yoshitaka, 4,217,627, Cl. 362-71.000.
Fujikake, Jun, to Furukawa Metals Co., Ltd. Heat transfer tube for use in boiling type heat exchangers and method of producing the same. 4,216,826, Cl. 165-133.000.
Fujikura, Takashi: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,217,305, Cl. 260-556.0AR.
Fujitsu Fanuc Limited: *See*—
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Fujitsu Limited: *See*—
Yamada, Seiichi; Kamehara, Nobuo; and Murakawa, Kyohei, 4,217,337, Cl. 423-626.000.
Fujiwara, Tadahiro: *See*—
Kubotera, Kikuo; Mizuki, Eiichi; Kawano, Hideo; and Fujiwara, Tadahiro, 4,217,408, Cl. 430-205.000.
Fukami, Harukazu: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, 4,217,366, Cl. 424-330.000.
Fukata, Akio, to Kubota, Ltd. All-wheel-drive type vehicle for construction work. 4,216,843, Cl. 180-245.000.
Fukazawa, Ikou: *See*—
Simazaki, Yuzuru; Doi, Ryota; Kumagai, Yuji; Fukazawa, Ikou; and Yamaguchi, Motoo, 4,217,514, Cl. 310-260.000.
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Nakamura, Ryuichi; Fukuhara, Seiji; Matsumoto, Shuichi; and Komatsu, Koei, 4,217,299, Cl. 260-464.000.
Fukui, Takashi: *See*—
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Fukui, Yoshiharu: *See*—
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Fukumizu, Shin'ichi: *See*—
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Fukunaga, Shinobu; and Yasuoka, Akihiko, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing semiconductor device. 4,217,153, Cl. 148-187.000.
Fulde, Stefan: *See*—
Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga, 4,217,365, Cl. 424-329.000.
Fuller, Robert J. Hydraulic gun. 4,216,907, Cl. 239-127.000.
Fulling, John: *See*—
Jessup, Frank L., 4,217,616, Cl. 361-31.000.
Fullmann, Marius; Sawitzki, Friedhelm; and Silber, Dieter, to Licentia-Patent Verwaltungs GmbH. Semiconductor switch with thyristors. 4,217,504, Cl. 307-252.00C.
Furstenberg, Joachim, to LTG Lufttechnische GmbH. Air filtering system. 4,217,119, Cl. 55-351.000.
Furukawa Metals Co., Ltd.: *See*—
Fujikake, Jun, 4,216,826, Cl. 165-133.000.
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha. Flaw detector for pipe employing magnets located outside the pipe and detector mounted inside and movable along the pipe with the magnets. 4,217,548, Cl. 324-220.000.
Furuya, Katsusuke: *See*—
Watanabe, Kenkichi; and Furuya, Katsusuke, 4,216,788, Cl. 133-8.00R.
Fyler, Norman F.: *See*—
Meissner, J. Michael; and Fyler, Norman F., 4,216,584, Cl. 33-143.00L.
G. D. Searle & Co.: *See*—
Yonan, Peter K., 4,217,306, Cl. 260-557.00R.
Gacki, Leonard W.; and Daly, Robert E., to Picker Corp. Fluid mixing and dispensing system. 4,217,054, Cl. 366-150.000.
Gaddis, Preston G. Process for admixing polymer emulsions with water to produce highly viscous liquids. 4,217,145, Cl. 106-170.000.
Gaffar, Abdul; and Gaffar, Maria C. S., to Colgate Palmolive Company. Magnesium polycarboxylate complexes as anticalculus agents. 4,217,342, Cl. 424-48.000.
Gaffar, Abdul; and Gaffar, Maria C. S., to Colgate Palmolive Company. Magnesium polycarboxylate complexes as anticalculus agents. 4,217,343, Cl. 424-48.000.
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Galan, Louis, to Bendix Corporation, The. Spill valve for a fluid control system. 4,216,752, Cl. 123-499.000.
Galati, Gaspare: *See*—
Lombardi, Paolo; and Galati, Gaspare, 4,217,584, Cl. 343-7.700.
Gamba, Alessandro: *See*—
Corbellini, Margherita; Gamba, Alessandro; and Busetto, Carlo, 4,217,245, Cl. 252-429.00B.
Gans, Ernest A. Puzzle game. 4,216,964, Cl. 273-153.00R.
Gard, Inc.: *See*—
Glueckert, Albert J.; Honegger, Robert J.; Nylund, Everett E.; and Saigh, Philip A., 4,216,554, Cl. 4-323.000.
Garnier, Marcel, to Micro-Mega S.A. Device for limiting the penetration of dental root canal instruments. 4,217,098, Cl. 433-147.000.
Garnier, Marcel A.; and Moreau, Rene J., to Agence Nationale de Valorisation de la Recherche (ANVAR). Process and device for the control of liquid metal streams. 4,216,800, Cl. 137-807.000.
Garrett Corporation, The: *See*—
Bridgnell, David G.; and Jacobsen, Frederick W., 4,216,937, Cl. 248-562.000.
Gasparrini, Guido: *See*—
Fiorito, Giancarlo; Gasparrini, Guido; and Svelto, Francesco, 4,217,490, Cl. 250-211.00J.

Gaston, Harold W.; Welborn, Ronald D.; and Humphreys, Samuel G., to Didde-Glaser, Incorporated. Mechanism for adjusting blanket-to-blanket squeeze of perfecting press. 4,216,718, Cl. 101-144.000.
Gastrock, Edward A., to Steward, Charles L.; and Gastrock Protein Corp. Apparatus for interconnecting tanks to prevent overflows and spills. 4,216,796, Cl. 137-571.000.
Gastrock Protein Corp.: *See*—
Gastrock, Edward A., 4,216,796, Cl. 137-571.000.
Gates Rubber Company, The: *See*—
Ellefson, Jerry K.; and Johnson, David E., 4,216,935, Cl. 248-360.000.
Gautier, Raoul L. A., to Societe Generale des Eaux Minerales de Vittel. Process of making containers made of thin pliable synthetic material. 4,216,639, Cl. 53-413.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Dinkelbach, Anton; and Weber, Karl-Heinz, 4,217,622, Cl. 361-175.000.
Gelsing, Winfried; and Nolzen, Hans-Martin, to Oschatz GmbH. Venturi-type workpiece-support nozzle. 4,217,097, Cl. 432-234.000.
Gendelman, Bernard: *See*—
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,217,541, Cl. 323-51.000.
General Atomic Company: *See*—
Leary, David F.; Cooper, Roy G.; and Miertschin, Gary N., 4,217,174, Cl. 176-82.000.
Schaffer, Michael J., 4,217,171, Cl. 176-7.000.
General Eastern Instruments Corporation: *See*—
Harding, John C., Jr., 4,216,669, Cl. 73-17.00A.
General Electric Company: *See*—
Bair, Eugene C.; and Kindig, Alan L., 4,216,806, Cl. 140-92.100.
Brunelle, Daniel J.; and Smith, William E., 4,217,438, Cl. 528-202.000.
Chiabrandy, Robert E., 4,216,698, Cl. 89-12.000.
Grauer, Edward C.; and Kennedy, William H., 4,216,633, Cl. 52-122.000.
Henry, George R.; and Spencer, William R., 4,216,672, Cl. 73-115.000.
Leffingwell, Edward A., 4,217,400, Cl. 429-7.000.
Lubarsky, Fred E.; and Walter, John L., 4,217,135, Cl. 75-123.00L.
Markezich, Ronald L.; and Takekoshi, Tohru, 4,217,281, Cl. 260-326.00A.
McGuffin, August L., 4,217,586, Cl. 343-100.0LE.
Miklas, Frank C., 4,216,763, Cl. 126-275.00R.
Milkovic, Miran, 4,217,546, Cl. 324-142.000.
Miller, Sammy L.; and Kindig, Alan L., 4,216,571, Cl. 29-596.000.
Peterson, Marvin A., 4,217,389, Cl. 428-383.000.
Racz, Janos A.; and Seppi, Edward J., 4,217,498, Cl. 250-385.000.
Racz, Janos A.; and Seppi, Edward J., 4,217,499, Cl. 250-445.00T.
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., 4,217,617, Cl. 361-51.000.
Uzgiris, Egidijus E.; and Bergeron, John A., 4,217,195, Cl. 204-195.00F.
Webb, William M., 4,217,010, Cl. 312-214.000.
General Foods Corporation: *See*—
Ault, Thomas W., 4,217,071, Cl. 414-395.000.
General Mills, Inc.: *See*—
Haub, John T.; Krassas, James G.; Rustad, Stanley C.; and Davis, Noel, 4,216,618, Cl. 47-65.000.
General Motors Corporation: *See*—
Baxter, William J.; and Arnott, David R., 4,217,180, Cl. 204-1.00T.
Dysarz, Dennis R., 4,217,314, Cl. 261-50.00R.
Herman, Avrum S.; Reider, Samuel B.; and Sharpe, Cecil H., 4,216,652, Cl. 60-748.000.
Johnson, Lauren L., 4,217,621, Cl. 361-170.000.
General Signal Corporation: *See*—
Schwab, Carl E., 4,217,592, Cl. 343-844.000.
Toth, Maria; and Reker, Frederick A., 4,217,474, Cl. 200-335.000.
General Tile & Rubber Company, The: *See*—
Kuan, Tiong Ho; and Sommer, John G., 4,217,395, Cl. 428-494.000.
George Koch Sons, Inc.: *See*—
Koch, Robert L., II, 4,216,592, Cl. 34-68.000.
Geppert, Steven, to Eaton Corporation. Optical digital sensor for crane operating aid. 4,216,868, Cl. 212-155.000.
Gerding, Charles C.; and Brown, Harry B., Jr., to Jones & Laughlin Steel Corporation. Vented coke oven door apparatus. 4,217,177, Cl. 202-248.000.
Germerdonk, Rolf; Jonas, Adam; Gockel, Claus; Huning, Werner; and Borger, Gotz-Gerald, to Bayer Aktiengesellschaft. Immersed safety device and method for protection against back-fire in explosive gas steams. 4,217,316, Cl. 261-123.000.
Gerry, Kenneth L.: *See*—
Mason, W. Alfred; and Gerry, Kenneth L., 4,216,950, Cl. 269-271.000.
Gerst, William J. Taximeter. 4,217,484, Cl. 235-92.0DN.
Gervais, Jean P.: *See*—
Maire, Jacques; Fourre, Jacques; Soisy sous Montmorency; and Gervais, Jean P., 4,217,336, Cl. 423-448.000.
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Harder, Klaus; and Schwert, Martin, 4,217,197, Cl. 204-243.00R.
Lagodka, Gunter; Rosenberg, Harry; Becker, Kunibert; and Dunkel, Gerd, 4,217,067, Cl. 405-296.000.
Ghelli, Giovanni, to Luigi Stoppani S.p.A. Highly selective oxidizing process for preparing pyridin-carboxylic acids. 4,217,457, Cl. 546-320.000.
Ghesquiere, Hendrik. Wave-operated power plant. 4,216,655, Cl. 60-398.000.
Gibb, Robert D.: *See*—
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Giladett, Leo V., to United States of America, Air Force. Bomblet fuze. 4,216,723, Cl. 102-223.000.
Giraud, Georges M., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull (Societe Anonyme). Arrangements for transmitting electrical signals between two devices which are connected by contacts. 4,217,572, Cl. 340-147.0SY.
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Langejan, Arend, 4,217,420, Cl. 435-256.000.
Giuffre, Anthony A. Heat exchange system for recycling stack heat. 4,216,903, Cl. 237-8.00R.
Giuffredi, Giancarlo, to Coster Tecnologie Speciali S.p.A. Aerosol dispensing valves. 4,216,884, Cl. 222-402.160.
Givaudan Corporation: *See*—
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,217,363, Cl. 424-320.000.
Glacier GmbH - DEVA Werke: *See*—
Waldhuter, Werner; and Lichtinghagen, Klaus, 4,217,140, Cl. 75-214.000.
Glanz, Kenneth D.; Becker, William J.; and Miller, Robert E., to Appleton Papers Inc. Process for making form sets from carbonless copy paper sheets. 4,217,162, Cl. 156-305.000.
Glatthorn, Raymond H., to Westinghouse Electric Corp. Apparatus for remotely repairing tubes in a steam generator. 4,216,893, Cl. 228-45.000.
Gleizes, Raymond M. X. Portable soldering apparatus. 4,216,894, Cl. 228-52.000.
Glenn, Edwin E., Jr., to Mobil Oil Corporation. Acoustic logging for examination of the cement bonding of well casing. 4,217,659, Cl. 367-35.000.
Glueckert, Albert J.; Honegger, Robert J.; Nylund, Everett E.; and Saigh, Philip A., to Gard, Inc. Automatic freeze-proof drain system. 4,216,554, Cl. 4-323.000.
Gobl, Irmgard, to Vockenhuber, Karl; and Hauser, Raimund. Camera objective of variable focal length. 4,217,033, Cl. 350-184.000.
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Golde, Hans-Dieter, to Stapla Hans-Dieter Golde GmbH & Co KG. Honeycomb frame for beehives. 4,216,557, Cl. 6-10.000.
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Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; and Golomovzjuk, Ivan K., 4,217,478, Cl. 219-97.000.
Golovko, Evgeny H.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Golymbieski, Walter J.: *See*—
Carnavos, Theodore C.; and Golymbieski, Walter J., 4,216,575, Cl. 29-597.000.
Goodman, John F., to Procter & Gamble Company, The. Photoactivated bleach-compositions and processes. 4,217,105, Cl. 8-111.000.
Goodyear Tire & Rubber Company, The: *See*—
Kersker, Theodore M.; and Rye, Grover W., 4,216,813, Cl. 152-361.0DM.
Goralnik, Charles D. Method for making a cut glass panel. 4,217,326, Cl. 264-254.000.
Gorbushin, Vladimir A.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Gorska-Poczopko, Jadwiga: *See*—
Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga, 4,217,365, Cl. 424-329.000.
Goto, Shuichi: *See*—
Aoki, Kazuhide; Kawagai, Kenji; Nagae, Akira; and Goto, Shuichi, 4,217,505, Cl. 307-273.000.
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; and Kawahara, Yuji, to Toyo Soda Manufacturing Co., Ltd. Refining additive and process for preparing same. 4,217,133, Cl. 75-58.000.
Gould Advance Limited: *See*—
Bardos, Peter A.; and Crowe, John E., 4,217,632, Cl. 363-26.000.
Gould Inc.: *See*—
Bourke, Robert F.; and Thimmesch, David M., 4,217,527, Cl. 318-139.000.
Bourke, Robert F.; and Thimmesch, David M., 4,217,529, Cl. 318-351.000.
Gryctko, Carl E.; DiMarco, Bernard; and Kralik, Andrew J., 4,217,472, Cl. 200-144.00R.
Gould, John S.; Winquist, Roger D.; Eve, William R., IV; McCutchen, James V.; Pelcher, Anthony M.; and Watson, Richard E., to Unique Mobility Inc. Electrically powered motor vehicle. 4,216,839, Cl. 180-65.00R.
Graber, Helen E., to Alegra Products, Inc. Medical pad. 4,216,774, Cl. 128-296.000.
Graf, Hans-Dieter, to Dr. Th. Bohme, Chem. Fabrik GmbH & Co. Process for the production of fur skins. 4,217,104, Cl. 8-94.140.

Graham, Alan A.: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,217,385, Cl. 428-159.000.

Grauer, Edward C.; and Kennedy, William H., to General Electric Company. Process and apparatus for elevating a folding roof system. 4,216,633, Cl. 52-122.000.

Gray, Gorman D. Tire chain links and fastening device. 4,216,811, Cl. 152-213.00A.

Great Circle Associates: *See*—
Mullerheim, Steven B.; and Williams, Fred G., Jr., 4,217,219, Cl. 210-65.000.

Greaves, Alan J.: *See*—
Rollett, John M.; and Greaves, Alan J., 4,217,562, Cl. 333-28.00R.

Greene, William D.: *See*—
Alfieri, Robert L.; Grice, James D.; and Greene, William D., 4,217,532, Cl. 318-759.000.

Gregory, Peter; and Harvey, Edwin D., to Imperial Chemical Industries Limited. Basic azo dyestuffs containing a n-picolinium alkylene amino phenyl group. 4,217,271, Cl. 260-156.000.

Grice, James D.: *See*—
Alfieri, Robert L.; Grice, James D.; and Greene, William D., 4,217,532, Cl. 318-759.000.

Grier, Nathaniel: *See*—
Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, 4,217,429, Cl. 525-411.000.

Griffin, Barbara J. Baby changing apparatus. 4,216,951, Cl. 269-328.000.

Griffith, Arvon M., to Abex Corporation. Composition railroad friction material with synthetic fiber content. 4,217,255, Cl. 260-17.200.

Griffith, James H.: *See*—
Shay, Greg D.; and Griffith, James H., 4,217,377, Cl. 427-195.000.

Grillet, Charles, to CGEE Alsthom. Stop device for stopping a wheeled vehicle. 4,216,724, Cl. 104-258.000.

Grimes, Jerry L. Bi-flow nasal cup. 4,216,769, Cl. 128-207.130.

Gripshover, Ronald J.: *See*—
Rice, Johnnie W.; Gripshover, Ronald J.; Rose, Millard F.; and Van Wagoner, Richard C., 4,217,468, Cl. 178-116.000.

Grobelny, Damian: *See*—
Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga, 4,217,365, Cl. 424-329.000.

Groger, Erwin. System for placing items. 4,217,070, Cl. 414-239.000.

Groh, Robert: *See*—
Volk, Anthony J.; and Groh, Robert, 4,216,565, Cl. 17-1.00G.

Grolman, Bernard: *See*—
Richards, William; and Grolman, Bernard, 4,216,588, Cl. 33-189.000.

Grosch, Karl A.; Mirtain, Henri J.; Devienne, Andre M.; and Trzepaez, Jean, to Uniroyal GmbH. Bead construction for a heavy duty pneumatic tire. 4,216,814, Cl. 152-362.00R.

Gross, Raymond: *See*—
Lotte, Andre; and Gross, Raymond, 4,216,888, Cl. 226-104.000.

Grove, John L., to JLG Industries, Inc. Industrial crane. 4,216,869, Cl. 212-165.000.

Gryctko, Carl E.; DiMarco, Bernard; and Kralik, Andrew J., to Gould Inc. Compact circuit breaker having high interrupting capacity. 4,217,472, Cl. 200-144.00R.

GTE Laboratories Incorporated: *See*—
Anderson, Bruce C., 4,217,574, Cl. 340-347.0AD.

GTE Products Corporation: *See*—
Kim, Han J.; Peters, Thomas E.; and Snee, David, 4,217,139, Cl. 75-206.000.
Kopelman, Bernard, 4,217,089, Cl. 431-362.000.

GTE Sylvania Wiring Devices Incorporated: *See*—
Tibolla, Julius F., 4,217,619, Cl. 361-56.000.

Guillaume, Francois: *See*—
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,216,577, Cl. 29-831.000.

Gulf Oil Corporation: *See*—
Kirkpatrick, Joel L., 4,217,459, Cl. 548-140.000.

Gulf Research & Development Company: *See*—
Paraskos, John A.; and Smith, Edward W., 4,217,202, Cl. 208-11.0LE.
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,217,287, Cl. 260-348.290.
Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,217,291, Cl. 260-429.00R.

Gumma, William H.: *See*—
Hughes, Donald R.; Gumma, William H.; and Zimmerman, Neil S., 4,217,571, Cl. 367-37.000.

Gunther, Albert W. Diving bell umbilical conveyor system. 4,217,066, Cl. 405-185.000.

Gurolnick, Richard C. Sink mounted infant bathing device. 4,216,552, Cl. 4-548.000.

Gurr, William R., to National Research Development Corporation. Recovery of uranium oxides by electrolysis. 4,217,181, Cl. 204-1.500.

Gutbrod, Robert: *See*—
Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, 4,217,265, Cl. 260-42.210.

Guthikonda, Ravindra N.: *See*—
Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., 4,217,453, Cl. 544-373.000.

Haber, Raphael R. G.; and Schoenberger, Eva. Nitrofuryl quinaldinic derivatives and preparation thereof. 4,217,456, Cl. 546-167.000.

Haberle, Walter. Toilet with folding lid. 4,216,553, Cl. 4-300.000.

Habermacher, Vinzenz: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, 4,217,304, Cl. 260-508.000.

Hackney, Howard U., Jr.: *See*—
Hollenbach, Roger C.; and Hackney, Howard U., Jr., 4,216,622, Cl. 47-71.000.

Haeussinger, John D. Extrication splint for accident victims. 4,216,556, Cl. 5-82.00R.

Hafotu Pty. Limited: *See*—
Varady, Joseph S.; and Knights, Robert C., 4,216,953, Cl. 271-11.000.

Hagedorn, Floyd T.; Rahrig, Donald D.; Revells, Robert G.; and Bushong, James A., to Libbey-Owens-Ford Company. Method of and apparatus for press bending glass sheets. 4,217,126, Cl. 65-106.000.

Hagen, Hans: *See*—
Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, 4,216,684, Cl. 74-751.000.

Hageniers, Omer L.: *See*—
Pryor, Timothy R.; and Hageniers, Omer L., 4,216,837, Cl. 177-1.000.

Hagerty, John P., to Hagerty Research & Development Co., Inc. Apparatus for transferring heat to fluids. 4,217,475, Cl. 219-10.510.

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Hagerty, John P., 4,217,475, Cl. 219-10.510.

Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, to Maschinefabrik Augsburg-Nuenberg Aktiengesellschaft. Hybrid drive for motor vehicles. 4,216,684, Cl. 74-751.000.

Hahn, William T.: *See*—
Medica, Joseph J.; and Hahn, William T., 4,217,380, Cl. 427-287.000.

Halbeisen, Jack: *See*—
Basile, Peter A.; Bochmann, Carl E.; and Halbeisen, Jack, 4,216,882, Cl. 222-207.000.

Haldeman, Charles W.: *See*—
Basmajian, Vahan V.; and Haldeman, Charles W., 4,216,593, Cl. 35-10.000.

Halfter, Georg: *See*—
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, 4,217,304, Cl. 260-508.000.

Hall, Barry M.: *See*—
Faulkner, Trevor L.; and Hall, Barry M., 4,217,637, Cl. 364-200.000.

Hall, Charles A., to Martin Marietta Corporation. Self-sealing fuel lines. 4,216,803, Cl. 138-144.000.

Hall, Charles E.; and Moore, Royston, to DEK Printing Machine Limited. Screen printing apparatus. 4,216,717, Cl. 101-123.000.

Hallam, Keith J., to Pullman Incorporated. Combination door and emergency stairway exit. 4,216,725, Cl. 105-348.000.

Halliburton Company: *See*—
Farris, Richard C.; and Butler, William S., 4,216,570, Cl. 29-434.000.
Murphey, Joseph R., 4,216,829, Cl. 166-276.000.
Watson, Jimmie L., 4,217,229, Cl. 252-8.55R.

Hamada, Hiroshi; Nakauchi, Hiroshi; Inami, Yasuhiko; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Method of driving electrochromic display means and electrochromic display means therefor. 4,217,579, Cl. 340-763.000.

Hamann, Waldemar: *See*—
Sandowicz, Michal; Wiaderek, Krzysztof; and Hamann, Waldemar, 4,217,080, Cl. 425-95.000.

Hamano, Eizaburo; Okada, Hisafumi; and Yamazaki, Hidetoshi, to Tokyo Shibaura Electric Co., Ltd. In-line type color picture tube apparatus. 4,217,566, Cl. 335-212.000.

Hamano, Kunihiro: *See*—
Ohtuka, Tadao; Ohe, Takeshi; and Hamano, Kunihiro, 4,216,841, Cl. 180-141.000.

Hamm, David E. Chain saw driven generator. 4,217,537, Cl. 320-56.000.

Hamma, Karlmann, to Zahnradfabrik Friedrichshafen AG. High-efficiency hydrostatic vehicular drive system. 4,216,656, Cl. 60-445.000.

Hammond, R. Philip: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,216,745, Cl. 123-26.000.

Hammonds, James C.: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,216,726, Cl. 410-64.000.

Handjani, Rose-Marie: *See*—
Vanlerberghe, Guy; and Handjani, Rose-Marie, 4,217,344, Cl. 424-60.000.

Handly, Robert J.; and Douglas, Robert H., to Honeywell Inc. Floating point arithmetic control. 4,217,657, Cl. 364-748.000.

Handte, Herbert; and Kollmar, Friedrich, to Moog GmbH. Control circuit adapted to control movement of a pintle relative to a die head. 4,217,635, Cl. 364-117.000.

Hanson, Lester. Machine for mining tar sands having rearwardly directed exhaust related to conveyor trough. 4,216,999, Cl. 299-57.000.

Hara, Yoshiaki; Mori, Shigeo; Murakami, Fumikazu; Horikoshi, Ichiro; and Takahasai, Soya, to Kabushiki Kaisha Daini Seikosha. Alarm wristwatch. 4,216,650, Cl. 368-72.000.

Harao, Norio; Tokizawa, Hiroki; and Nishikawa, Teruhide, to Tokyo Shibaura Electric Co., Ltd. Direct-viewing storage tube with opaque strip on transparent collector adjacent scan area. 4,217,518, Cl. 313-398.000.

Harbert, Charles A.; and Lombardino, Joseph G., to Pfizer Inc. Amide therapeutic agents. 4,217,355, Cl. 424-270.000.

Harder, Klaus; and Schwert, Martin, to Gewerkschaft Eisenhutte Westfalia. Apparatus for removing anode residue from anodes of electrolytic melt baths. 4,217,197, Cl. 204-243.00R.

Hardgrove, John A.: *See—*
Burge, Harland L.; Hardgrove, John A.; and Krieve, Walter F., 4,217,132, Cl. 75-26.000.

Harding, John C., Jr., to General Eastern Instruments Corporation. Contaminant error reduction system for dew point hygrometers. 4,216,669, Cl. 73-17.00A.

Harendza-Harinxma, Alfred J. Apparatus for processing municipal solid waste and sewage sludge. 4,217,222, Cl. 210-177.000.

Harless, Clarence E.; and Tiger, Jessie C. Drying rack for fire hose. 4,216,931, Cl. 248-89.000.

Harms, Wolfgang: *See—*
Steffan, Guido; Borgmann, Ernst; Buchel, Peter; and Harms, Wolfgang, 4,217,209, Cl. 210-53.000.

Harris, Alfred W., to Boeing Commercial Airplane Company. Target type thrust reverser. 4,216,923, Cl. 244-110.00B.

Harris, J. Nimrod, Jr.; and Howell, Willie M., to Pickett Hosiery Mills, Inc. Cushion stitch construction for men's hosiery. 4,216,662, Cl. 66-186.000.

Harris, William B.: *See—*
Davison, Richard R.; and Harris, William B., 4,216,751, Cl. 123-523.000.

Hartley, Henry F.; and Schuberth, Ralph G., to Honeywell Information Systems Inc. Logic for generating multiple clock pulses within a single clock cycle. 4,217,639, Cl. 364-200.000.

Hartline, Albert G., III, to Allegheny Ludlum Steel Corporation. Corrosion resistant austenitic stainless steel. 4,217,136, Cl. 75-128.00A.

Hartline, Albert G., III, to Allegheny Ludlum Steel Corporation. Corrosion resistant austenitic steel. 4,217,150, Cl. 148-2.000.

Harvey, Edwin D.: *See—*
Gregory, Peter; and Harvey, Edwin D., 4,217,271, Cl. 260-156.000.

Harvey, James A.: *See—*
Fezatt, Peter W.; Harvey, James A.; and Harvey, Ronald A., 4,216,833, Cl. 172-805.000.

Harvey, Robert J.: *See—*
Downie, David E.; Harvey, Robert J.; and Rueff, John R., 4,216,776, Cl. 128-305.000.

Harvey, Ronald A.: *See—*
Fezatt, Peter W.; Harvey, James A.; and Harvey, Ronald A., 4,216,833, Cl. 172-805.000.

Hasegawa, Katsumi: *See—*
Tambara, Nobuhiko; Hasegawa, Katsumi; and Yasuda, Toshio, 4,216,920, Cl. 242-18.00A.

Hasenbeck, Harold W. Conduction type soil matric potential sensor. 4,216,789, Cl. 137-78.00D.

Hashimoto, Masami: *See—*
Takamatsu, Takehiko; Toyomura, Akihiro; and Hashimoto, Masami, 4,216,942, Cl. 254-310.000.

Hashimoto, Shinichi: *See—*
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,217,305, Cl. 260-556.0AR.

Hashimoto, Takeshi: *See—*
Sugano, Katsumi; Hashimoto, Takeshi; Hashizume, Shinzi; Ikegami, Yoshio; and Fukumizu, Shin'ichi, 4,217,322, Cl. 264-176.00R.

Hashimoto, Tsutomu: *See—*
Baba, Nobuyuki; and Hashimoto, Tsutomu, 4,217,223, Cl. 210-198.00C.

Hashizume, Shinzi: *See—*
Sugano, Katsumi; Hashimoto, Takeshi; Hashizume, Shinzi; Ikegami, Yoshio; and Fukumizu, Shin'ichi, 4,217,322, Cl. 264-176.00R.

Hatori, Yoshinori; and Yamamoto, Hideo, to Kokusai Denshin Denwa Kabushiki Kaisha. Adaptive predictive coding system for television signals. 4,217,609, Cl. 358-136.000.

Hatter, Edwin E., to Hi-Shear Corporation. Depth gage. 4,216,585, Cl. 33-169.00B.

Hattori, Ichiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,216,647, Cl. 368-245.000.

Hattori, Tadashi: *See—*
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,216,653, Cl. 60-276.000.

Haub, John T.; Krassas, James G.; Rustad, Stanley C.; and Davis, Noel, to General Mills, Inc. Method and apparatus for increasing the spacing between plants in accordance with their growth rate. 4,216,618, Cl. 47-65.000.

Haugwitz, Rudiger D., to E. R. Squibb & Sons, Inc. Substituted phenylguanidines and method. 4,217,358, Cl. 424-274.000.

Hauler, Peter; Bremer, Wolfgang; Weiss, Karl-Ernst; and Heintz, Frieder, to Robert Bosch GmbH. Apparatus for generating a pulse when a first member passes a second member using permanent magnets with different strengths. 4,217,512, Cl. 310-155.000.

Hauser, Raimund: *See—*
Gobl, Irmgard, 4,217,033, Cl. 350-184.000.

Havalda, Paul: *See—*
Albrecht, Bernhard; Frey, Hans; Habermacher, Vinzenz; Havalda, Paul; and Halfter, Georg, 4,217,304, Cl. 260-508.000.

Haven, John B.: *See—*
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., 4,217,617, Cl. 361-51.000.

Hawley, Robert L., to Ralston Purina Company. Composition and method for growing parasitic insect larvae. 4,217,367, Cl. 426-2.000.

Hayase, Masashi; Ecklund, Richard C.; Walkington, Robert J.; Hughes, James B.; and Williams, Neil R., to McDonnell Douglas Corporation. Metallic sandwich structure and method of fabrication. 4,217,397, Cl. 428-594.000.

Hayashi, Tetsuaki; Shiiyama, Hideo; Kinoshita, Mikio; and Nagai, Hiroshi, to Kubota, Ltd. Travel speed change apparatus for a farm vehicle. 4,216,680, Cl. 74-473.00R.

Hayes, Fay A.; and Hayes, Leonard L. Apparatus for heating plastic pipe. 4,217,096, Cl. 432-225.000.

Hayes, Leonard L.: *See—*
Hayes, Fay A.; and Hayes, Leonard L., 4,217,096, Cl. 432-225.000.

Hazleton Systems, Inc.: *See—*
Moss, Owen R., 4,216,741, Cl. 119-15.000.

Heckles, John S., to Armstrong Cork Company. Acrylate-acetoacetate polymers useful as protective agents for floor coverings. 4,217,396, Cl. 428-500.000.

Heckles, John S., to Armstrong Cork Company. Acrylate-acetoacetamide polymers. 4,217,439, Cl. 528-220.000.

Hedstrom, Norman A.: *See—*
Wright, David M.; O'Toole, Jerome; and Hedstrom, Norman A., 4,217,008, Cl. 312-184.000.

Heidenreich, Johann, to Societe Anonyme dite: Technime S.A. Process and means for breaking emulsions. 4,217,210, Cl. 210-28.000.

Heimann, Lester, to Electro-Catheter Corporation. Medical device container and method of manufacture. 4,216,860, Cl. 206-370.000.

Heintz, Frieder: *See—*
Hauler, Peter; Bremer, Wolfgang; Weiss, Karl-Ernst; and Heintz, Frieder, 4,217,512, Cl. 310-155.000.

Heinz, Jorg. Flexible ornamental article and fastener therefor. 4,216,567, Cl. 24-81.00J.

Heinzer, Hans E.: *See—*
Reh, Oswald R.; and Heinzer, Hans E., 4,217,028, Cl. 350-96.200.

Heitmann, Wayne R., to Abbott Laboratories. Process for making N-(2-methyl-1-naphthyl)-maleimide. 4,217,282, Cl. 260-326.50C.

Heizmann, Frieder: *See—*
Lavanchy, Jean-Pierre; and Heizmann, Frieder, 4,217,053, Cl. 356-372.000.

Held, Gerhard: *See—*
Popp, Gerhard; and Held, Gerhard, 4,217,154, Cl. 148-189.000.

Hengartner, Alex; Wachter, Peter; and Baumann, Kurt. Electrostatic powder spray gun. 4,216,915, Cl. 239-698.000.

Henkel Corporation: *See—*
Peerman, Dwight E.; and Kanten, H. Gordon, 4,217,256, Cl. 260-18.00N.

Henoch, Bengt, to Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan I Stockholm. Device for two-way information link. 4,217,549, Cl. 455-81.000.

Henrick, Clive A.: *See—*
Anderson, Richard J.; and Henrick, Clive A., 4,217,302, Cl. 260-465.00D.

Henry, Donald E.; Murrell, Thomas A.; Schilt, Marvin H.; and Weaver, Alfred C., to Struthers-Dunn, Inc. Process control system that controls its outputs according to the results of successive analysis of the vertical input columns of a hypothetical ladder diagram. 4,217,658, Cl. 364-900.000.

Henry, George R.; and Spencer, William R., to General Electric Company. Apparatus for detecting and indicating the occurrence of a gas turbine engine compressor stall. 4,216,672, Cl. 73-115.000.

Herman, Avrum S.; Reider, Samuel B.; and Sharpe, Cecil H., to General Motors Corporation. Integrated, replaceable combustor swirler and fuel injector. 4,216,652, Cl. 60-748.000.

Herman Miller, Inc.: *See—*
Propst, Robert L., 4,217,073, Cl. 414-421.000.

Herold, William H.: *See—*
Robnett, James J.; and Herold, William H., 4,217,076, Cl. 414-735.000.

Herrington, George B.; and Allen, Earl J., to Herrington, George B. Container support. 4,217,013, Cl. 312-322.000.

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Heyl, Walter, to Linde Aktiengesellschaft. Piston for a hydrostatic axial-piston machine. 4,216,704, Cl. 92-78.000.

Hi-Shear Corporation: *See—*
Hatter, Edwin E., 4,216,585, Cl. 33-169.00B.

Hickman, Ronald P., to Inventec International Limited. Workbenches. 4,216,949, Cl. 269-139.000.

High Tech, Inc.: *See—*
Wright, Ronnie G., 4,216,786, Cl. 131-180.000.

Highland Supply Corporation: *See—*
Weder, Erwin H.; and Weder, Donald E., 4,216,620, Cl. 47-72.000.

Hijikata, Kunio: *See—*
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Hillberry, Benny M.; and Kettelkamp, Donald B., to Purdue Research Foundation. Semi-stable total knee prosthesis. 4,216,549, Cl. 3-1.911.

Hiller, Edwin R.; Kaplan, Philip D.; Nicosia, Joseph M., Jr.; and Zuerndorfer, Henry D., to Raytheon Company. Moving target indicator (MTI) radar systems. 4,217,583, Cl. 343-7.700.

Hiller, Heinrich: *See—*
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Hindin, Saul G.; and Roberts, George W., to Engelhard Minerals & Chemicals Corporation. Process for exchanging hydrogen isotopes between gaseous hydrogen and water. 4,217,332, Cl. 423-249.000.

Hirano, Itsuo: *See—*
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; and Kawahara, Yuji, 4,217,133, Cl. 75-58.000.
Hirano, Reiji; Mochizuki, Koichi; Yasui, Tokio; and Shimazu, Jyoji, to Canon Kabushiki Kaisha. Electronic calculator. 4,217,656, Cl. 364-710.000.
Hirano, Takashi: *See—*
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Hirata, Sadao: *See—*
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Hirata, Shinji, to West Electric Co., Ltd. Photographic flash device. 4,217,523, Cl. 315-241.00P.
Hirata, Shunsaku: *See—*
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
Hirose, Yoshiteru: *See—*
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Hirota, Tetsuya: *See—*
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Hirtz, Pierre, to Thomson-CSF. Diode which transmits and receives light-rays of the same predetermined wavelength and optical telecommunications device using such a diode. 4,217,597, Cl. 357-19.000.
Hisadomi, Masaki: *See—*
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Hitachi, Ltd.: *See—*
Chiba, Akio; Imahashi, Hiromichi; Tomita, Sadami; and Utsumi, Yoshiharu, 4,217,568, Cl. 335-298.000.
Shimodaira, Toyohisa, 4,216,848, Cl. 188-71.200.
Simazaki, Yuzuru; Doi, Ryota; Kumagai, Yuji; Fukazawa, Ikou; and Yamaguchi, Motoo, 4,217,514, Cl. 310-260.000.
Tojo, Kenji; Kousokabe, Hirokatu; Arai, Nobukatsu; and Sato, Eiji, 4,216,661, Cl. 62-505.000.
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Hjortzberg, Bernhard A., to BASF Aktiengesellschaft. Method and apparatus for processing color television signals. 4,217,603, Cl. 358-12.000.
Hoch, Helmut; and Hiller, Heinrich, to BASF Aktiengesellschaft. Preparation of transparent and easily dispersible perylene-3,4,9,10-tetracarboxylic acid diimide pigments of high tinctorial strength. 4,217,455, Cl. 546-37.000.
Hoechst Aktiengesellschaft: *See—*
Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, 4,217,265, Cl. 260-42.210.
Melzer, Werner; Jaenicke, Dieter; and Schroeder, Helmut, 4,217,108, Cl. 23-230.0PC.
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Hoenig, Stuart A.: *See—*
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Hoffman, Joseph A.; Savides, Christos; and Oppelt, John C., to American Cyanamid Company. Polymeric pentaerythrityl phosphonates and their use as flame retardants. 4,217,267, Cl. 260-45.75D.
Hoffmann-La Roche Inc.: *See—*
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,217,363, Cl. 424-320.000.
Hofmann, Robert A.; and Kusche, David W., to Brunswick Corporation. Automatic locking latch. 4,216,984, Cl. 292-91.000.
Hogan, William F., to Spectrum X-Ray Corporation. Latching mechanism. 4,217,064, Cl. 403-33.000.
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, to BASF Aktiengesellschaft. Isolation of formic acid from its aqueous solutions. 4,217,460, Cl. 562-609.000.
Hojo, Yoshikata: *See—*
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.
Holden, Paul J., to Alta Products Company. Splice boot with retention means. 4,217,465, Cl. 174-138.00F.
Holland Corporation, The: *See—*
Holland, Raymond P., Jr., 4,216,929, Cl. 244-153.00R.
Holland, Raymond P., Jr., to Holland Corporation, The. Kites. 4,216,929, Cl. 244-153.00R.
Holland, Richard W., to Fairchild Camera & Instrument Corp. Electrical device connections. 4,217,020, Cl. 339-75.00M.
Hollenbach, Roger C.; and Hackney, Howard U., Jr. Plant container. 4,216,622, Cl. 47-71.000.
Holmes, Robert E., to Tektronix, Inc. Thin-film microcircuits adapted for laser trimming. 4,217,570, Cl. 338-308.000.
Holmes, Terry M., to J. I. Case Company. Method of forming hollow boom. 4,216,895, Cl. 228-178.000.
Holobaugh, Raymond, to Mohasco Corporation. Wall proximity chair with rear drive linkage. 4,216,991, Cl. 297-85.000.
Holzner, Gunter, to Firmenich SA. Process for the stabilization of perfumes. 4,217,250, Cl. 252-522.00R.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ban, Keisuke; and Arai, Takeo, 4,216,682, Cl. 74-579.00E.
Matsushita, Takeshi; Ida, Jinsei; and Otsuka, Kazuo, 4,216,572, Cl. 29-568.000.
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Honeywell Inc.: *See—*
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Handly, Robert J.; and Douglas, Robert H., 4,217,657, Cl. 364-748.000.
Honeywell Information Systems Inc.: *See—*
Hartley, Henry F.; and Schuberth, Ralph G., 4,217,639, Cl. 364-200.000.
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Tufts, Lewis E.; and Mentz, Bernardus J., 4,217,187, Cl. 204-98.000.
Hooper, John O.; Stone, W. James; and Burklund, Vernon D., to United States of America, Navy. Microwave radiometric attitude reference system. 4,216,928, Cl. 244-122.0AD.
Hopkins, John R.: *See—*
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Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, to Ricoh Company, Ltd. Charging phase control device for ink jet recording device. 4,217,595, Cl. 346-75.000.
Horikiri Spring Manufacturing Co., Ltd.: *See—*
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Horikoshi, Ichiro: *See—*
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Hornfeck, Werner: *See—*
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Hornle, Reinhold: *See—*
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Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.
Horovitz, Zola P.; and Rubin, Bernard, to E. R. Squibb & Sons, Inc. Method of treating hypertension and medicaments therefor. 4,217,347, Cl. 424-246.000.
Hoshino Gakki Seizo, Inc.: *See—*
Hoshino, Masao, 4,216,695, Cl. 84-421.000.
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Hoshino, Toshisuke: *See—*
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.
Hoskinson, William R.: *See—*
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Hough, Louis E.; and Shifflett, David C., to Empire Automotive, Inc. Detachable sunroof for automobiles. 4,216,983, Cl. 292-263.000.
Howarth, Louis E., to Bell Telephone Laboratories, Incorporated. Fiberoptic-electronic connector assembly. 4,217,030, Cl. 350-96.210.
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Harris, J. Nimrod, Jr.; and Howell, Willie M., 4,216,662, Cl. 66-186.000.
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., to Dayco Corporation. Power transmission belt. 4,216,679, Cl. 474-238.000.
Hoya Corporation: *See—*
Toratani, Hisayoshi, 4,217,382, Cl. 428-66.000.
Huang, Lung-Fei. Box for reserving cassette or cartridge. 4,216,857, Cl. 206-1.500.
Hubbard, William M., to Bell Telephone Laboratories, Incorporated. Secure optical communication components, method, and system. 4,217,488, Cl. 455-612.000.
Huch, Albert. Dish-electrode concentration meter with detachable transducer. 4,217,196, Cl. 204-195.00B.
Huebner, Wolfgang, to Siemens Aktiengesellschaft. Angle adapter for an electrical component. 4,217,017, Cl. 339-17.00F.
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, to Societe Anonyme dite: La Telephonie Industrielle et Commerciale-TELIC. Current limiter. 4,217,503, Cl. 307-237.000.
Hughes Aircraft Company: *See—*
Verzwyvelt, Scott A., 4,217,404, Cl. 429-206.000.
Hughes, Donald R.; Gumma, William H.; and Zimmerman, Neil S., to Standard Oil Company (Indiana). Stutter seismic source. 4,217,571, Cl. 367-37.000.

Hughes, James B.: *See*—
Hayase, Masashi; Ecklund, Richard C.; Walkington, Robert J.; Hughes, James B.; and Williams, Neil R., 4,217,397, Cl. 428-594.000.
Hughes, John L.; Seyler, Jay K.; and Liu, Robert C. Synthesis of peptides. 4,217,268, Cl. 260-112.50T.
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Huning, Werner: *See*—
Germerdonk, Rolf; Jonas, Adam; Gockel, Claus; Huning, Werner; and Borger, Gotz-Gerald, 4,217,316, Cl. 261-123.000.
Hunter, Walter D., to Texaco Development Corporation. Secondary recovery process. 4,217,230, Cl. 252-8.55D.
Huperz, Adalbert; and Maasberg, Wolfgang, to Woma Apparatebau Wolfgang Maasberg & Co. GmbH. High-pressure liquid-jet gun. 4,216,911, Cl. 239-526.000.
Hurlburt, George H.: *See*—
Olsen, John H.; Hurlburt, George H.; and Kapcsandy, Louis E., 4,216,906, Cl. 239-11.000.
Hurni, William M.: *See*—
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Hydrocarbon Research, Inc.: *See*—
Chervenak, Michael C., 4,217,201, Cl. 208-8.00R.
Johanson, Edwin S., 4,217,112, Cl. 48-210.000.
Nongbri, Govanon, 4,217,206, Cl. 208-251.00H.
Ichida, Katsumi. Internal combustion engine with subsidiary combustion chamber. 4,216,748, Cl. 123-253.000.
Ichikawa, Singo; Ishida, Fujio; and Kawashima, Hideyuki, to Citizen Watch Company Limited. Function selection circuit for multi-function timepiece. 4,216,649, Cl. 368-109.000.
Ichinomiya, Tsutomu: *See*—
Yamamura, Yukio; Ichinomiya, Tsutomu; and Ishimaru, Shinichi, 4,216,956, Cl. 272-70.000.
Ida, Jinsei: *See*—
Matsushita, Takeshi; Ida, Jinsei; and Otsuka, Kazuo, 4,216,572, Cl. 29-568.000.
Igarashi, Yuriko: *See*—
Okada, Yoshio; Igarashi, Yuriko; and Watanabe, Kozyu, 4,217,241, Cl. 252-316.000.
Iida, Akio, to Kabushiki Kaisha Komatsu Seisakusho. Actuator device for actuating ejector of scraper. 4,216,700, Cl. 91-170.00R.
Iida, Tetsuya: *See*—
Suzuki, Yasoji; Hitotsuyanagi, Takeshi; and Iida, Tetsuya, 4,217,535, Cl. 320-48.000.
Iijima, Yaichi: *See*—
Momose, Haruhiko; Yamada, Masashi; and Iijima, Yaichi, 4,217,043, Cl. 354-25.000.
Iinuma, Kazuhiro; Takamizawa, Kinya; and Ogura, Ichiro, to Tokyo Shibaura Electric Co., Ltd. Probe for ultrasonic diagnostic apparatus. 4,217,516, Cl. 310-335.000.
Iizuka, Shigeo: *See*—
Tasaki, Takaharu; Iizuka, Shigeo; and Saito, Tadao, 4,216,883, Cl. 222-321.000.
Ikeda, Yoshio: *See*—
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Ikegami, Kouzaburo; Morio, Yasumasa; and Sakai, Hitoshi, to Sakura Color Products Corporation. Synthetic resin nib. 4,217,060, Cl. 401-265.000.
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Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, to Kabushiki Kaisha Daini Seikosha. Electronic watch. 4,216,646, Cl. 368-28.000.
Illinois Tool Works, Inc.: *See*—
Olsen, Robert C.; and Edwards, Bryant, 4,216,621, Cl. 47-73.000.
Illum, Asger, to Aktieselskabet Laur. Knudsen, Nordisk Elektricitets Selskab. Screwless wire terminal and spring clip therefor. 4,217,021, Cl. 339-95.00D.
Imahashi, Hiromichi: *See*—
Chiba, Akio; Imahashi, Hiromichi; Tomita, Sadami; and Utsumi, Yoshiharu, 4,217,568, Cl. 335-298.000.
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co., Ltd. Phenylethanolamine derivatives. 4,217,305, Cl. 260-556.0AR.
Imperial Chemical Industries Limited: *See*—
Ellis, Peter M.; and Gibb, Robert D., 4,217,159, Cl. 156-177.000.
Gregory, Peter; and Harvey, Edwin D., 4,217,271, Cl. 260-156.000.
Shephard, Margaret C.; and Worthington, Paul A., 4,217,129, Cl. 71-76.000.
Inaba, Shigeho: *See*—
Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,217,349, Cl. 424-248.400.
Inaba, Yoshisada, to Shinsei Kinzoku Seisakusho. Collapsible chair. 4,216,995, Cl. 297-443.000.
Inada, Masami; Ohumi, Takeharu; and Tsunekawa, Masaru, to Aisin Seiki Kabushiki Kaisha. Solenoid actuated valve device. 4,216,938, Cl. 251-65.000.
Inami, Mamoru; and Tanaka, Yoshiaki, to Victor Company of Japan, Limited. Fluorescent indicator tube and related circuit. 4,217,578, Cl. 340-754.000.
Inami, Yasuhiko: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Inami, Yasuhiko; and Uede, Hisashi, 4,217,579, Cl. 340-763.000.
Information Identification Company, Inc.: *See*—
Freeny, Charles C., Jr., 4,217,588, Cl. 343-112.00D.
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Rilbe, Harry, 4,217,193, Cl. 204-180.00G.
Ingersoll-Rand Company: *See*—
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Inoue, Eiichi; and Takeda, Misturu, to Dai Nippon Insatsu Kabushiki Kaisha. Image forming material comprising polyacids of Mo or W or their salts or complexes. 4,217,409, Cl. 430-346.000.
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, to Yoyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Kogyo Kabushiki Kaisha. Fuel air mixture supply system for use in fuel-injection-type internal combustion engine. 4,216,753, Cl. 123-445.000.
Institut National de la Sante et de la Recherche Medicale: *See*—
Rubel, Paul; and Arnaud, Pierre, 4,216,780, Cl. 128-699.000.
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Quash, Gerard A., 4,217,338, Cl. 424-1.000.
Intech Laboratories, Inc.: *See*—
Entenman, Alan, 4,217,551, Cl. 375-88.000.
Inteq, Inc.: *See*—
Tuck, Winfree P., 4,217,624, Cl. 361-394.000.
Inter Royal Corporation: *See*—
Benoit, Roland A., 4,216,994, Cl. 297-162.000.
International Business Machines Corporation: *See*—
Avritt, Michael D.; Lamos, Richard A.; and Rosati, Alfonso A., 4,216,955, Cl. 271-296.000.
DeKeersmaecker, Roger F.; DiMaria, Donelli J.; and Young, Donald R., 4,217,601, Cl. 357-54.000.
Joshi, Madhukar L.; Mason, Richard K.; and Pricer, Wilbur D., 4,216,573, Cl. 29-571.000.
Matla, Arno; and Zimmermann, Volker, 4,217,612, Cl. 360-78.000.
Meece, Kermit A.; and Taylor, Thomas S., 4,217,594, Cl. 346-75.000.
Melcher, Robert L.; and von Gutfeld, Robert J., 4,217,183, Cl. 204-15.000.
Roe, David; and Sowter, Brian R., 4,217,577, Cl. 340-703.000.
International Computers Limited: *See*—
Faulkner, Trevor L.; and Hall, Barry M., 4,217,637, Cl. 364-200.000.
International Flavors & Fragrances Inc.: *See*—
Schmitt, Frederick L., 4,217,253, Cl. 252-522.00R.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,217,371, Cl. 426-538.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.
International Harvester Company: *See*—
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Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,216,972, Cl. 277-39.000.
International Packaging Corp.: *See*—
Beauchamp, Roger P., 4,216,858, Cl. 206-45.150.
International Standard Electric Corporation: *See*—
Oldham, Ronald C., 4,217,464, Cl. 174-79.000.
Titchmarsh, James G., 4,217,123, Cl. 65-3.00A.
International Telephone and Telegraph Corporation: *See*—
Kao, Charles K., 4,217,029, Cl. 350-96.210.
November, Milton H., 4,216,673, Cl. 73-861.000.
Reh, Oswald R.; and Heinzer, Hans E., 4,217,028, Cl. 350-96.200.
Intracoastal Pipe Repair & Supply Co., Inc.: *See*—
Long, Thomas R., 4,216,586, Cl. 33-178.00B.
Inventec International Limited: *See*—
Hickman, Ronald P., 4,216,949, Cl. 269-139.000.
Inverness International Corporation: *See*—
Cottingham, Hugh V., 4,216,775, Cl. 128-303.180.
Inzuki Buero Fuer Technische Projekte und Patente Aktiengesellschaft: *See*—
Schmidt, Maria, 4,216,617, Cl. 47-62.000.
Ionics Inc.: *See*—
McRae, Wayne A., 4,217,186, Cl. 204-98.000.
Ippolito, Anthony C.: *See*—
Machanian, William V.; Ippolito, Anthony C.; and Hoskinson, William R., 4,216,693, Cl. 84-1.030.
Ishida, Fujio: *See*—
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Ishimaru, Shinichi: *See*—
Yamamura, Yukio; Ichinomiya, Tsutomu; and Ishimaru, Shinichi, 4,216,956, Cl. 272-70.000.

Itek Corporation: *See*—
Chang, I-Cheng, 4,217,036, Cl. 350-358.000.
Ito, Hideo; and Kawanabe, Yoshihiro, to Pioneer Electronic Corporation. Output amplifying circuit. 4,217,556, Cl. 330-268.000.
Ito, Tsuneo, to NGK Spark Plug Co. Ltd. Nickel alloy heater in glow plug. 4,217,138, Cl. 75-170.000.
Iwaki, Yoshiyuki: *See*—
Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, 4,216,892, Cl. 228-44.10R.
Iwamatsu, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Amplifier circuit arrangement with stabilized power-supply current. 4,217,555, Cl. 330-267.000.
Iwasaki, Kyuhachiro: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,217,595, Cl. 346-75.000.
Izawa, Taketoshi: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,217,345, Cl. 424-180.000.
IZON Corporation: *See*—
Yevick, George J., 4,217,041, Cl. 353-120.000.
Izu, Masatsugu: *See*—
Ovshinsky, Stanford R.; and Izu, Masatsugu, 4,217,374, Cl. 427-39.000.
Izumi, Masao, to Nissan Motor Company, Limited. Airflow distributing device for automotive air-conditioning system. 4,216,822, Cl. 165-42.000.
Izumi, Toshio, to Sawafuji Electric Co., Ltd. Supply voltage monitoring device for automotive battery. 4,217,536, Cl. 320-48.000.
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Lang, Pierre, 4,217,069, Cl. 414-45.000.
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Youngers, Stephen A.; and Neufeld, Sidney B., 4,217,001, Cl. 299-82.000.
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Jack, Whitfield. Device for inhaling powdered substance. 4,216,768, Cl. 128-203.150.
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Jacksen, Peter J.; Kuklin, Arlen J.; Jacksen, Peter R.; and Vessely, James F., 4,217,047, Cl. 354-77.000.
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Eiland, P. Frank; and Jacobs, David R., 4,217,061, Cl. 403-313.000.
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Jacomini, Omar J., to Westinghouse Electric Corp. Antenna beam steering controller. 4,217,587, Cl. 343-100.0SA.
Jacques, Andre; Malsot, Christian; Moronvalle, Chantal; and Bertau, Edith, to Socapex. Device for crimping ferrules onto bundles of optical fibres. 4,217,084, Cl. 425-321.000.
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d'Auria, Luigi; de Crenoux, Baudoin; and Jacques, Andre, 4,217,598, Cl. 357-19.000.
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Cash, David R., 4,216,688, Cl. 83-42.000.
Jamet, Daniel: *See*—
Petit, Andre; and Jamet, Daniel, 4,217,023, Cl. 339-121.000.
Janik, Daniel. Bank checking system. 4,216,979, Cl. 283-58.000.
Jansma, Roger H.: *See*—
Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., 4,217,425, Cl. 525-155.000.
Japan Styrene Paper Corporation, Ltd.: *See*—
Komori, Tetsuo, 4,217,319, Cl. 264-53.000.
Japan Synthetic Rubber Co., Ltd.: *See*—
Nakamura, Ryuichi; Fukuhara, Seiji; Matsumoto, Shuichi; and Komatsu, Koei, 4,217,299, Cl. 260-464.000.
Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, to Etablissements Nativelle S.A. Amino-3-cardenolide derivatives, process for their preparation, and pharmaceutical compositions containing same. 4,217,280, Cl. 260-239.570.
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Erickson, William V.; Jarvie, Paul K.; and Miller, Fred L., 4,216,785, Cl. 131-173.000.
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Rawles, William T.; and Jenkins, Kenneth, 4,217,462, Cl. 13-10.000.
Jenks, Harry E. Well pump stripping tool. 4,216,625, Cl. 51-34.00G.
Jennen, Friedrich; and Tricoire, Jean, to Bayer Aktiengesellschaft. Thermographic plate for measuring temperature distributions. 4,217,373, Cl. 427-2.000.
Jensen, Tor A., to Spiro Investment S.A. Connecting lengths of tubing. 4,216,981, Cl. 285-97.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See*—
Levy, Richard H., 4,217,494, Cl. 250-282.000.
Jessup, Frank L., to Fulling, John. Motor overload protection circuit. 4,217,616, Cl. 361-31.000.
Jidosha Kika Co., Ltd.: *See*—
Ohtuka, Tadao; Ohe, Takeshi; and Hamano, Kunihiro, 4,216,841, Cl. 180-141.000.
Jinnai, Koichiro: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,217,595, Cl. 346-75.000.
JLG Industries, Inc.: *See*—
Grove, John L., 4,216,869, Cl. 212-165.000.
Johanson, Edwin S., to Hydrocarbon Research, Inc. Production of fuel gas by liquid phase hydrogenation of coal. 4,217,112, Cl. 48-210.000.
Johansson, Bengt O.: *See*—
Sjoholm, Claes B.; and Johansson, Bengt O., 4,217,647, Cl. 364-510.000.
John, E. Roy. Methods of electrophysiological testing. 4,216,781, Cl. 128-731.000.
John Fluke Mfg. Co., Inc.: *See*—
Strong, Norman H., 4,217,543, Cl. 324-62.000.
John Heathcoat & Company Limited: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,217,323, Cl. 264-235.000.
John Zink Company: *See*—
Reed, Robert D., 4,217,088, Cl. 431-181.000.
Johnson, David E.: *See*—
Ellefson, Jerry K.; and Johnson, David E., 4,216,935, Cl. 248-360.000.
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Passafiume, Anthony; Lamber, Clarence F.; and Dickover, William, 4,216,687, Cl. 83-26.000.
Johnson, Kenneth V.: *See*—
Bonneson, Garland W.; and Johnson, Kenneth V., 4,216,870, Cl. 212-223.000.
Johnson, Lauren L., to General Motors Corporation. Circuit for detecting diode shorting. 4,217,621, Cl. 361-170.000.
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Germerdonk, Rolf; Jonas, Adam; Gockel, Claus; Huning, Werner; and Borger, Gotz-Gerald, 4,217,316, Cl. 261-123.000.
Jones, Howard: *See*—
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Gerding, Charles C.; and Brown, Harry B., Jr., 4,217,177, Cl. 202-248.000.
Jonsson, Kenneth J.: *See*—
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Jorio, Nadine: *See*—
Daniel, Jean-Claude; and Jorio, Nadine, 4,217,260, Cl. 260-29.60H.
Joshi, Madhukar L.; Mason, Richard K.; and Pricer, Wilbur D., to International Business Machines Corporation. Three mask process for making field effect transistors. 4,216,573, Cl. 29-571.000.
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McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., 4,217,428, Cl. 525-191.000.
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Stoffels, Carl A., 4,216,686, Cl. 82-53.000.
Juijn, Johannes A.: *See*—
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Jung, Werner, to Robert Bosch GmbH. Recording carrier for electrical discharge recording apparatus. 4,217,596, Cl. 346-135.100.
Jung, William E. Can crushing mechanism. 4,216,713, Cl. 100-209.000.
Jurgensen, David J.; and Landsman, Howard A., to Tektronix, Inc. Variable start multiburst signal generator. 4,217,610, Cl. 358-139.000.
Kabara, Jon J., to Michigan State University. Antimicrobial compositions. 4,217,364, Cl. 424-320.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Hara, Yoshiaki; Mori, Shigeo; Murakami, Fumikazu; Horikoshi, Ichiro; and Takahasai, Soya, 4,216,650, Cl. 368-72.000.
Hattori, Ichiro, 4,216,647, Cl. 368-245.000.
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,216,646, Cl. 368-28.000.
Shimotsuma, Nobuo, 4,217,540, Cl. 323-22.00R.
Kabushiki Kaisha Kankyo Kaihatsu: *See*—
Muta, Natsuo, 4,216,738, Cl. 118-72.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Okuyama, Yasuhiko; Tanaka, Koji; Nakayama, Yoshiro; and Kato, Hiroshi, 4,216,692, Cl. 84-1.010.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Iida, Akio, 4,216,700, Cl. 91-170.00R.
Takamatsu, Takehiko; Toyomura, Akihiro; and Hashimoto, Masami, 4,216,942, Cl. 254-310.000.
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Nakamura, Osamu, 4,217,057, Cl. 400-636.000.

Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Coated perfluorosulfonic acid resin membranes and a method for their preparation. 4,217,198, Cl. 204-252.000.
Kahle, James F.: *See*—
Kay, David S.; and Kahle, James F., 4,217,217, Cl. 210-59.000.
Kahmann, Albrecht; and Siewert, Wolfgang, to Escher Wyss GmbH. Fiberizer. 4,216,918, Cl. 241-46.00B.
Kahn, Leonard R. Audio signal transmission system and method incorporating automatic frequency correction. 4,217,661, Cl. 455-59.000.
Kaise, Hirotsugu: *See*—
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Kaiser, Dennis G.; and Kaiser, Robert D. Mousetrap. 4,216,606, Cl. 43-83.000.
Kaiser, Emil T. Synthesis of steroids. 4,217,279, Cl. 260-239.55R.
Kaiser, Howard; and Kaiser, Laurie A. C. Pneumatic monitor for indicating strength of contractile muscles. 4,216,783, Cl. 128-778.000.
Kaiser, Laurie A. C.: *See*—
Kaiser, Howard; and Kaiser, Laurie A. C., 4,216,783, Cl. 128-778.000.
Kaiser, Robert D.: *See*—
Kaiser, Dennis G.; and Kaiser, Robert D., 4,216,606, Cl. 43-83.000.
Kali und Salz Aktiengesellschaft: *See*—
Loblich, Karl-Richard, 4,217,333, Cl. 423-306.000.
Kaltenbach & Voight GmbH & Co.: *See*—
Loge, Hans, 4,217,101, Cl. 433-126.000.
Kaltz, Milton C. Glass panel for land vehicles. 4,217,391, Cl. 428-428.000.
Kamehara, Nobuo: *See*—
Yamada, Seiichi; Kamehara, Nobuo; and Murakawa, Kyohei, 4,217,337, Cl. 423-626.000.
Kamenev, Alexandr F.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Kamenev, Vladimir F.: *See*—
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Kamp, Ewald A., to Union Carbide Corporation. Plastic bag handle construction. 4,216,899, Cl. 229-54.00R.
Kampeen, Yves; Hoppe, Bernd; and Rebsamen, Ernst, to Escher Wyss Limited. Pusher centrifuge. 4,217,226, Cl. 210-376.000.
Kanebo Ltd.: *See*—
Asano, Koin, 4,217,381, Cl. 427-340.000.
Kano, Fumio: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
Kanten, H. Gordon: *See*—
Peerman, Dwight E.; and Kanten, H. Gordon, 4,217,256, Cl. 260-18.00N.
Kao, Charles K., to International Telephone and Telegraph Corporation. Interlocking precision optical fiber connector or support. 4,217,029, Cl. 350-96.210.
Kao Soap Co., Ltd.: *See*—
Tsuchiya, Yoshimi; and Mizutani, Hiroshi, 4,216,772, Cl. 128-284.000.
Kapcsandy, Louis E.: *See*—
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Kaplan, Philip D.: *See*—
Hiller, Edwin R.; Kaplan, Philip D.; Nicosia, Joseph M., Jr.; and Zuerndorfer, Henry D., 4,217,583, Cl. 343-7.700.
Karlsson, Bengt G., to Berol Kemi AB. Process for the selective extraction of metal cations from aqueous solutions thereof and compositions. 4,217,235, Cl. 252-184.000.
Karrena GmbH: *See*—
Bottenbruch, Hermann, 4,216,709, Cl. 98-58.000.
Kaspar, Vaclav: *See*—
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.
Kasper, Robin: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzo, 4,216,974, Cl. 280-42.000.
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Kato, Hidetoshi: *See*—
Matsumoto, Shigeo; Tago, Koichi; and Kato, Hidetoshi, 4,217,015, Cl. 316-30.000.
Kato, Hiroshi: *See*—
Okuyama, Yasuhiko; Tanaka, Koji; Nakayama, Yoshiro; and Kato, Hiroshi, 4,216,692, Cl. 84-1.010.
Kato, Hisao; and Sakamoto, Yohei. Method of collecting shellfish. 4,216,595, Cl. 37-195.000.
Kato, Shogo: *See*—
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Kato, Yoshiaki; and Yamaguchi, Hirotsugu, to Nissan Motor Company, Limited. Apparatus for indicating the distance over which a vehicle can travel with the residual fuel. 4,217,644, Cl. 364-442.000.
Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Benzisoxazole derivatives. 4,217,349, Cl. 424-248.400.
Katzen, Raphael; Moon, George D., Jr.; and Kumana, Jimmy D., to Raphael Katzen Associates International, Inc. Distillation system for motor fuel grade anhydrous alcohol. 4,217,178, Cl. 203-19.000.
Kauffman, Ray B. Water depth-loran position recorder. 4,217,593, Cl. 346-62.000.
Kaufman, Charles R. Unit load wrapping machine. 4,216,640, Cl. 53-556.000.
Kaufmann, Meinolph: *See*—
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Kawada, Tohsuke: *See*—
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Kawagai, Kenji: *See*—
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Kawaguchi, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Controlling means for a dual vehicle hydraulic braking system. 4,217,004, Cl. 303-6.00C.
Kawahara, Yuji: *See*—
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Kawai, Masanobu: *See*—
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Kawamura, Sigeru: *See*—
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Kubotera, Kikuo; Mizuki, Eiichi; Kawano, Hideo; and Fujiwara, Tadahiro, 4,217,408, Cl. 430-205.000.
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Kawazoe, Tetsu: *See*—
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Kay, David S.; and Kahle, James F. PH Control system for carbonated beverage plants. 4,217,217, Cl. 210-59.000.
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Kedem, Ora; Kedem, Abraham; Lev, Menashe; Tanny, Gerald B.; and Messalem, Rami, to Yeda Research & Development Co. Ltd. Membranes. 4,217,200, Cl. 204-301.000.
Keeler, Miner S., II. Humidifier and moving indoor sculpture. 4,217,315, Cl. 261-120.000.
Keldmann, Erik C. V., to Elpan ApS. Baseboard heating apparatus with cable carrier. 4,216,823, Cl. 165-55.000.
Kelemen, Jozsef; Kuhl, Eickhard; and Schmid, Karl, to Ciba-Geigy Corporation. Composition for scintillation counting. 4,217,239, Cl. 252-301.170.
Kellenbenz, Carl W.; and Boney, George R. Thyristor firing circuit module with integral optical isolation, dv/dt limitation, and bidirectional voltage transient suppression. 4,217,618, Cl. 361-56.000.
Kelly, Robert R., to BJ-Hughes Inc. Wide angle inclinometer. 4,216,590, Cl. 33-304.000.
Kelsey Hayes Co.: *See*—
Main, John A., 4,217,003, Cl. 301-37.00S.
Neill, Daniel L., 4,216,849, Cl. 188-138.000.
Kempton, Marvin L., to United States of America, Navy. Rod-fragment controlled-motion warhead (U). 4,216,720, Cl. 102-67.000.
Kennametal Inc.: *See*—
Stephenson, Earle W.; and Hutzell, Clyde G., 4,216,832, Cl. 172-540.000.
Kennedy, James V.: *See*—
Friedrich, Heinz G.; and Kennedy, James V., 4,217,295, Cl. 260-449.60M.
Kennedy, William H.: *See*—
Grauer, Edward C.; and Kennedy, William H., 4,216,633, Cl. 52-122.000.
Kerby, Robert C., to Cominco Ltd. Method and apparatus for control of electrowinning of zinc. 4,217,189, Cl. 204-119.000.
Kerridge, Kenneth A.: *See*—
Vida, Julius A.; and Kerridge, Kenneth A., 4,217,274, Cl. 260-239.100.
Kersker, Theodore M.; and Rye, Grover W., to Goodyear Tire & Rubber Company, The. Radial tire with a belt structure of different reinforcement cords. 4,216,813, Cl. 152-361.0DM.
Kessinger, Orville E., Jr., to Caterpillar Tractor Co. Seal. 4,216,973, Cl. 277-92.000.

Kettelkamp, Donald B.: *See*—
Hillberry, Benny M.; and Kettelkamp, Donald B., 4,216,549, Cl. 3-1.911.
Key, Anthony J.: *See*—
Ashton, Michael E.; and Key, Anthony J., 4,216,816, Cl. 164-54.000.
Keyes, Melvin H.: *See*—
Barabino, Raymond C.; and Keyes, Melvin H., 4,217,415, Cl. 435-98.000.
Kiefer, Hans: *See*—
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, 4,217,460, Cl. 562-609.000.
Kieffer, Don L. Apparatus useful for loading and securing a boat onto a vehicle. 4,216,887, Cl. 224-310.000.
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, to Mitsubishi Chemical Industries, Ltd. Pharmaceutically active 2-(4-aminobutoxy)stilbenes. 4,217,366, Cl. 424-330.000.
Kim, Han J.; Peters, Thomas E.; and Snee, David, to GTE Products Corporation. Process of preparing an electrical contact material. 4,217,139, Cl. 75-206.000.
Kimbrough, Wade L. 360 Degree internal spray cleaning. 4,216,910, Cl. 239-456.000.
Kimura, Morihiro: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.
Kinder, George W.; and Winter, Harry, to Bell Telephone Laboratories, Incorporated. Method and structure for generating representations of repetitive electrical waveforms. 4,217,524, Cl. 315-364.000.
Kindig, Alan L.: *See*—
Bair, Eugene C.; and Kindig, Alan L., 4,216,806, Cl. 140-92.100.
Miller, Sammy L.; and Kindig, Alan L., 4,216,571, Cl. 29-596.000.
King, Edward I., Jr.; and Reed, Brian J., to Westinghouse Electric Corp. Stator core cooling for dynamoelectric machines. 4,217,511, Cl. 310-55.000.
King, George E., to Standard Oil Company (Indiana). Low fluid loss foam. 4,217,231, Cl. 252-8.55R.
Kinoshita, Mikio: *See*—
Hayashi, Tetsuaki; Shiiyama, Hideo; Kinoshita, Mikio; and Nagai, Hiroshi, 4,216,680, Cl. 74-473.00R.
Kirchhofer, James E., to A. R. Wood Manufacturing Company. Multi-tiered cage and feed device. 4,216,742, Cl. 119-18.000.
Kirkpatrick, Joel L., to Gulf Oil Corporation. Benzylthio-1,3,4-thiadiazol-2-yl ureas. 4,217,459, Cl. 548-140.000.
Kirner, Kuno, to Robert Bosch GmbH. Ignition distributor with noise suppression electrodes. 4,217,470, Cl. 200-19.00R.
Kishimoto, Akira: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
Kitagawa, Ryuichi: *See*—
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Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Shutter blade control device for automatic focusing camera. 4,217,049, Cl. 354-195.000.
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Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.
Kizaki, Ziro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Return spring retention for a vehicle drum brake. 4,216,850, Cl. 188-216.000.
Kjeer, Clayton P., to National Computer Systems, Inc. Self-calibrating apparatus for photoelectrically scanning answer documents. 4,217,487, Cl. 235-468.000.
Klafs, Ulrich, to Zarges Leichtbau GmbH. Fitting for joints of ladder sections. 4,216,844, Cl. 182-104.000.
Klaila, William J. Combined structural support and solar energy system. 4,216,762, Cl. 126-421.000.
Klaus, Gerald R., to Fellowes Manufacturing Company. Storage unit. 4,217,012, Cl. 312-292.000.
Klaus, John F.; and Liotta, F. James, to Electronic Associates, Inc. Multi-user analog/hybrid system. 4,217,652, Cl. 364-601.000.
Klein, Darrell L.: *See*—
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,216,679, Cl. 474-238.000.
Klein, Herman C., to McDonnell Douglas Corporation. Lighted instrument dial face display. 4,217,625, Cl. 362-30.000.
Kliklok Corporation: *See*—
Collura, Peter C.; and Humphries, Richard L., 4,216,897, Cl. 229-35.000.
Klockner-Werke AG: *See*—
Warnke, Hans, 4,216,876, Cl. 220-319.000.
Kloepper, John O.: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,216,726, Cl. 410-64.000.
Knickerbocker, Robert H., to Siemon Company, The. Universal mounting bracket for circuit blocks. 4,216,934, Cl. 248-309.00A.
Knights, Robert C.: *See*—
Varady, Joseph S.; and Knights, Robert C., 4,216,953, Cl. 271-11.000.
Knirsch, Erich: *See*—
Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, 4,216,684, Cl. 74-751.000.
Kobayashi, Akio, to Nippondenso Co., Ltd. Air-to-fuel ratio control apparatus. 4,216,750, Cl. 123-435.000.
Kobayashi, Kazuo; Yuki, Kiyohiro; and Suzuki, Yutaka, to Nippon Telegraph & Telephone Public Corporation. Amplitude and periodic phase modulation transmission system. 4,217,467, Cl. 178-67.100.
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Tanaka, Koichi; Kobayashi, Kenji; and Aonuma, Shigeo, 4,217,406, Cl. 430-137.000.
Kobayashi, Motonobu: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.
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Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,217,349, Cl. 424-248.400.
Kobe Steel, Limited: *See*—
Sugano, Katsumi; Hashimoto, Takeshi; Hashizume, Shinzi; Ikegami, Yoshio; and Fukumizu, Shin'ichi, 4,217,322, Cl. 264-176.00R.
Kobylinski, Thaddeus P.: *See*—
Wu, Ching-Yong; and Kobylinski, Thaddeus P., 4,217,291, Cl. 260-429.00R.
Koch, Earl E.; and Ehrhart, Philip J., to Sperry Corporation. Crop harvesting machine. 4,216,641, Cl. 56-14.400.
Koch, Robert L., II, to George Koch Sons, Inc. Drying oven. 4,216,592, Cl. 34-68.000.
Kocina, Lawrence A.; and Roche, John N., to R. D. Werner Co., Inc. Picture frame retaining clip. 4,216,597, Cl. 40-156.000.
Kodama, Yutaka: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,217,595, Cl. 346-75.000.
Koeble, Earl A., to Stauffer Chemical Company. Pressure sensitive adhesive formulation. 4,217,434, Cl. 525-329.000.
Koenig, Jean-Jacques: *See*—
Jarreau, Francois-Xavier; and Koenig, Jean-Jacques, 4,217,280, Cl. 260-239.570.
Koerner, Gotz; and Rott, Hans, to Th. Goldschmidt AG. Textile fiber finishes. 4,217,228, Cl. 252-8.600.
Koh-I-Noor Rapidograph, Inc.: *See*—
Straszewski, Klaus; Rauterberg, Jochen; and Zuchner, Werner, 4,217,058, Cl. 401-135.000.
Kohzai, Yoshinori; and Oyama, Shigeaki, to Fujitsu Fanuc Limited. Direct current motor. 4,217,513, Cl. 310-186.000.
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Hatori, Yoshinori; and Yamamoto, Hideo, 4,217,609, Cl. 358-136.000.
Kollmar, Friedrich: *See*—
Handte, Herbert; and Kollmar, Friedrich, 4,217,635, Cl. 364-117.000.
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Sasaki, Tadao; Komaru, Isamu; and Yoshioka, Ryuzo, 4,217,335, Cl. 423-345.000.
Komatsu, Koei: *See*—
Nakamura, Ryuichi; Fukuhara, Seiji; Matsumoto, Shuichi; and Komatsu, Koei, 4,217,299, Cl. 260-464.000.
Komori, Tetsuo, to Japan Styrene Paper Corporation, Ltd. Process for producing polyolefin foams. 4,217,319, Cl. 264-53.000.
Komoriya, Kiyoshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Technology. Swing type hydraulic servo-actuator. 4,216,701, Cl. 91-49.000.
Kondo, Kazuko: *See*—
Yoshino, Youziro; and Kondo, Kazuko, 4,217,285, Cl. 260-345.500.
Kondo, Kenji: *See*—
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,216,653, Cl. 60-276.000.
Konig, Klaus: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.
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Nakaya, Keiichi; Sato, Kimihiko; and Konishi, Kenji, 4,217,330, Cl. 422-193.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Momose, Haruhiko; Yamada, Masashi; and Iijima, Yaichi, 4,217,043, Cl. 354-25.000.
Kono, Hisashi; Nakai, Shigeyuki; Hisadomi, Masaki; Minemura, Norimichi; Okita, Tetsuo; and Kawamura, Sigeru, to Ube Industries, Ltd. Process for producing urea granules. 4,217,127, Cl. 71-28.000.
Kono, Masao: *See*—
Tani, Tatsuo; and Kono, Masao, 4,217,052, Cl. 355-8.000.
Kopelman, Bernard, to GTE Products Corporation. Photoflash lamp. 4,217,089, Cl. 431-362.000.
Kopf, Rudi; and Trefz, Walter, to Filterwerk Mann & Hummel GmbH. Air intake filter with cyclone separator stage and dust collection pan. 4,217,118, Cl. 55-330.000.

Kopse, Odon, to Robert Bosch GmbH. Fuel injection nozzle. 4,216,912, Cl. 239-533.400.

Kornatowski, Boleslaw, to Singer Company, The. Automatic bobbin winding system. 4,216,733, Cl. 112-184.000.

Kosonocky, Walter F.: *See*—
Carnes, James E.; Dawson, Robert H.; and Kosonocky, Walter F., 4,217,605, Cl. 358-31.000.

Kosyrev, Felix K.; Timofeev, Valery A.; Pekh, Anatoly K.; and Leonov, Alexandr P. Gas laser. 4,217,560, Cl. 331-94.50D.

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Bonnes, Eugene D.; Kotian, Vijayraj M.; and MenMuir, Paul C., 4,216,802, Cl. 138-143.000.

Kousokabe, Hirokatu: *See*—
Tojo, Kenji; Kousokabe, Hirokatu; Arai, Nobukatsu; and Sato, Eiji, 4,216,661, Cl. 62-505.000.

Kowa Company Ltd.: *See*—
Yamada, Shun-ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,217,284, Cl. 260-343.30P.

Kraess, Henri: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,217,503, Cl. 307-237.000.

Kralik, Andrew J.: *See*—
Gryctko, Carl E.; DiMarco, Bernard; and Kralik, Andrew J., 4,217,472, Cl. 200-144.00R.

Kramer, Henry H.: *See*—
Dam, Naim G.; Picunko, Thomas; and Kramer, Henry H., 4,217,642, Cl. 364-416.000.

Krapcho, John, to E. R. Squibb & Sons, Inc. Carbamate derivatives of mercaptoacyl hydroxy prolines. 4,217,359, Cl. 424-274.000.

Kraska, Robert E.; and Lessar, Joseph F., to Medtronic, Inc. Gold based alloy composition and brazing therewith, particularly for ceramic-metal seals in electrical feedthroughs. 4,217,137, Cl. 75-165.000.

Krassas, James G.: *See*—
Haub, John T.; Krassas, James G.; Rustad, Stanley C.; and Davis, Noel, 4,216,618, Cl. 47-65.000.

Kraus, Werner. Long-term endoprosthesis. 4,216,548, Cl. 3-1.910.

Kraus, Willibald, to TRW Inc. Molding retainer. 4,216,637, Cl. 52-718.000.

Krieg, Adrian H., to Widder Corporation. Apparatus for automatically controlling the cutting of pipes, plates and the like. 4,216,945, Cl. 266-56.000.

Krieve, Walter F.: *See*—
Burge, Harland L.; Hardgrove, John A.; and Krieve, Walter F., 4,217,132, Cl. 75-26.000.

Krisp, Werner; and Reuss, Mira. Denture cleansing tablet and method of manufacturing the same. 4,217,234, Cl. 252-99.000.

Krivenko, Valery G.: *See*—
Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; and Golomovzjuk, Ivan K., 4,217,478, Cl. 219-97.000.

Krob, Erwin, to TMC Corporation. Heel-release binding with a coupled ski brake. 4,216,976, Cl. 280-605.000.

Kroenke, William J., to B. F. Goodrich Company, The. Process for making amine molybdates. 4,217,292, Cl. 260-429.00R.

Kroh, Adolf: *See*—
Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, 4,217,265, Cl. 260-42.210.

Kruer, Melvin R.: *See*—
Bartoli, Filbert J.; Esterowitz, Leon; Allen, Roger E.; and Kruer, Melvin R., 4,217,547, Cl. 324-158.00R.

Kuan, Tiong Ho; and Sommer, John G., to General Tile & Rubber Company, The. Method of coating rubber with a composition which resists removal by water. 4,217,395, Cl. 428-494.000.

Kubota, Ltd.: *See*—
Fukata, Akio, 4,216,843, Cl. 180-245.000.
Hayashi, Tetsuaki; Shiiyama, Hideo; Kinoshita, Mikio; and Nagai, Hiroshi, 4,216,680, Cl. 74-473.00R.

Kubotera, Kikuo; Mizuki, Eiichi; Kawano, Hideo; and Fujiwara, Tadahiro, to Fuji Photo Film Co., Ltd. Printing plate material. 4,217,408, Cl. 430-205.000.

Kuchler, Fritz, to Brain Dust Patents Establishment. Automatic sausage slicing and weighing system. 4,217,650, Cl. 364-567.000.

Kuchuk-Yatsenko, Sergei I.; Krivenko, Valery G.; and Golomovzjuk, Ivan K. Device for controlling butt welding machine. 4,217,478, Cl. 219-97.000.

Kuck, Mark A.; and Miller, Gary K., to Stauffer Chemical Company. Continuous process for preparing metal alkoxides. 4,217,184, Cl. 204-59.0QM.

Kuhl, Eickhard: *See*—
Kelemen, Jozsef; Kuhl, Eickhard; and Schmid, Karl, 4,217,239, Cl. 252-301.170.

Kuhl, Martin, to Rosenthal Technik AG. Composite insulators. 4,217,466, Cl. 174-209.000.

Kuhnis, Hans: *See*—
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,217,350, Cl. 424-250.000.

Kuklin, Arlen J.: *See*—
Jacksen, Peter J.; Kuklin, Arlen J.; Jacksen, Peter R.; and Vessely, James F., 4,217,047, Cl. 354-77.000.

Kullick, Werner: *See*—
Pischtschan, Alfred; Wolf, Karlheinz; Hornle, Reinhold; Bremer, Fritz; Arnold, Bernhard; and Kullick, Werner, 4,217,266, Cl. 260-42.210.

Kumagai, Yuji: *See*—
Simazaki, Yuzuru; Doi, Ryota; Kumagai, Yuji; Fukazawa, Ikou; and Yamaguchi, Motoo, 4,217,514, Cl. 310-260.000.

Kumana, Jimmy D.: *See*—
Katzen, Raphael; Moon, George D., Jr.; and Kumana, Jimmy D., 4,217,178, Cl. 203-19.000.

Kunzel, Hans E.: *See*—
Elfert, Klaus; Wolf, Gerhard D.; Bentz, Francis; and Kunzel, Hans E., 4,217,227, Cl. 210-500.00M.

Kuo, Mau-Jung: *See*—
Tolbert, William R.; Feder, Joseph; Kuo, Mau-Jung; and Folkman, Moses J., 4,217,412, Cl. 435-68.000.

Kurandt, Uwe: *See*—
Goedecke, Ralf; Kurandt, Uwe; and Moller, Rolf, 4,217,451, Cl. 544-190.000.

Kurechi, Taisuke: *See*—
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Okada, Yoshio; Igarashi, Yuriko; and Watanabe, Kozyu, 4,217,241, Cl. 252-316.000.

Kuribayashi, Akio: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.

Kurland, Jerome J., to Metropolitan Sanitary District of Greater Chicago. Automatic cleaning of sensing probes. 4,216,671, Cl. 73-61.00R.

Kuroda, Kotofusa: *See*—
Murata, Kazuo; and Kuroda, Kotofusa, 4,216,579, Cl. 29-730.000.

Kuroda, Ryozo: *See*—
Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, 4,216,892, Cl. 228-44.10R.

Kurzweil, Karel: *See*—
Badet, Bernard; Guillaume, Francois; and Kurzweil, Karel, 4,216,577, Cl. 29-831.000.

Kusche, David W.: *See*—
Hofmann, Robert A.; and Kusche, David W., 4,216,984, Cl. 292-91.000.

Kushida, Shozo: *See*—
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,216,646, Cl. 368-28.000.

Kusui, Shoji; Yamazaki, Nobuyasu; and Ikeda, Yoshio, to Nihon Denki Keiki Kenteisho. Electronic type polyphase electric energy meter. 4,217,545, Cl. 324-107.000.

Kusumoto, Hikoichi: *See*—
Nakamura, Kansei; Kusumoto, Hikoichi; and Yokono, Yoshinobu, 4,217,525, Cl. 315-381.000.

Kuzma, Edward J., to Celanese Corporation. Alkyd resins with use of multifunctional monomers. 4,217,257, Cl. 260-22.0CB.

Kwasnitza, Hans-Dieter, to De La Rue Giori S.A. Apparatus for diverting paper sheets or the like from a first path into a second path. 4,216,954, Cl. 271-283.000.

Kyoden, Hiroshi: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Tsuruta, Teruyuki; Kawai, Masanobu; Matsukuma, Ikuo; Teranishi, Masayuki; and Nakamizo, Nobuhiro, 4,217,130, Cl. 71-95.000.

Kyriacou, Demetrios; Edamura, Fred Y.; and Love, Jim, to Dow Chemical Company, The. Electrolytic production of certain trichloropicolinic acids and/or 3,6-dichloropicolinic acid. 4,217,185, Cl. 204-73.00R.

L & M Radiator, Inc.: *See*—
Braun, Richard R.; Petaja, Glen E.; and Cedar, Charles E., 4,216,824, Cl. 165-69.000.

Lady Bea Enterprises, Inc.: *See*—
Thomas, Wayne W.; and Thomas, Walter C., 4,217,602, Cl. 358-3.000.

Lafarge Fondu International: *See*—
Mathieu, Alain, 4,217,144, Cl. 106-104.000.

Lagana', Vincenzo; and Zardi, Umberto, to Snamprogetti, S.p.A. Process for recovering powders obtained from apparatuses used for treating liquid or solid materials. 4,217,114, Cl. 55-70.000.

Lagodka, Gunter; Rosenberg, Harry; Becker, Kunibert; and Dunkel, Gerd, to Gewerkschaft Eisenhutte Westfalia. Mine roof support assembly. 4,217,067, Cl. 405-296.000.

Lakra, Paul, to Lucas Industries Limited. Fuel injection system. 4,216,754, Cl. 123-447.000.

Lamber, Clarence F.: *See*—
Passafiume, Anthony; Lamber, Clarence F.; and Dickover, William, 4,216,687, Cl. 83-26.000.

Lamboo, Theodorus F.: *See*—
Van den Brink, Hans G.; Van Hoof, Albertus J. F. M.; Van Kleef, Johannes H. K. C.; and Lamboo, Theodorus F., 4,217,559, Cl. 331-94.50C.

La Mers, Herbert. Labelling system. 4,217,164, Cl. 156-541.000.

Lamos, Richard A.: *See*—
Avritt, Michael D.; Lamos, Richard A.; and Rosati, Alfonso A., 4,216,955, Cl. 271-296.000.

Landsman, Howard A.: *See*—
Jurgensen, David J.; and Landsman, Howard A., 4,217,610, Cl. 358-139.000.

Lang, Pierre, to J. Bobst & Fils, S.A. Device for automatically receiving sheets in a pile and for removing a pile of sheets from a sheet processing apparatus. 4,217,069, Cl. 414-45.000.

Langejan, Arend, to Gist-Brocades N.V. Active dried baker's yeast. 4,217,420, Cl. 435-256.000.

Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Preparation of dihalogenovinylcyclopropanecarboxylic acids and esters. 4,217,300, Cl. 260-465.00D.

Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., to R & D Associates. Unthrottled lean mixture gasoline engine. 4,216,745, Cl. 123-26.000.

Lavanchy, Jean-Pierre; and Heizmann, Frieder, to Robert Bosch GmbH. Apparatus and method to test workpieces for size, relative position, material integrity, and the like. 4,217,053, Cl. 356-372.000.

Lawrence Brothers, Inc.: *See*—
McNinch, Delmar; and Schuttler, William K., 4,216,986, Cl. 292-341.170.

Lawson, Dale W. R., to Rohr Industries, Inc. Linkage system for a turbo fan engine thrust reverser. 4,216,926, Cl. 244-110.00B.

Le Carbone-Lorraine: *See*—
Maire, Jacques; Fourre, Jacques; Soisy sous Montmorency; and Gervais, Jean P., 4,217,336, Cl. 423-448.000.

Leary, David F.; Cooper, Roy G.; and Miertschin, Gary N., to General Atomic Company. Manufacture of nuciear fuel compacts. 4,217,174, Cl. 176-82.000.

Leasor, Paul J.; Pulskamp, Gerald S.; and Stammen, Harold A., to Crown Controls Corporation. Slip sheet lift truck. 4,217,074, Cl. 414-642.000.

Lecoeur, Jean-Pierre E.: *See*—
Degraeve, Francois R.; Divay, Rene G.; and Lecoeur, Jean-Pierre E., 4,216,838, Cl. 180-14.00R.

Leder, Frederic: *See*—
Sartori, Guido; and Leder, Frederic, 4,217,237, Cl. 252-192.000.

Ledex, Inc.: *See*—
Roy, Kenneth L.; and Sadgebury, William D., 4,217,567, Cl. 335-255.000.

Lee, Sang H.: *See*—
Suh, Nam P.; Fillion, Paul D.; and Lee, Sang H., 4,217,113, Cl. 51-309.000.

Leffingwell, Edward A., to General Electric Company. Rechargeable electrochemical cell pack having overcurrent protection. 4,217,400, Cl. 429-7.000.

Le Frock, Jack L.; and Schell, Ronald F. Novel enrichments for blood culture media. 4,217,411, Cl. 435-34.000.

Leggett & Platt, Incorporated: *See*—
Crum, McDonald, 4,216,992, Cl. 297-85.000.

Legue, Norris R., to Synthetic Surfaces, Inc. High green strength curable urethane adhesive. 4,217,254, Cl. 260-3.300.

Le Guen, Jacques: *See*—
Delair, Jacques; and Le Guen, Jacques, 4,217,517, Cl. 313-56.000.

Lehto, Eino M.: *See*—
Zellner, John R.; Lehto, Eino M.; and Polinsky, Michael V., 4,217,039, Cl. 353-27.00R.

Lemelson, Jerome H. Eyeglass shields. 4,217,037, Cl. 351-44.000.

Leonov, Alexandr P.: *See*—
Kosyrev, Felix K.; Timofeev, Valery A.; Pekh, Anatoly K.; and Leonov, Alexandr P., 4,217,560, Cl. 331-94.50D.

Le Page, Jean-Francois: *See*—
Marcilly, Christian; Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,217,205, Cl. 208-139.000.

Lerch, Ronald E.; and Partridge, Jerry A., to United States of America, Energy. Decontamination of metals using chemical etching. 4,217,192, Cl. 204-149.000.

Les Cables de Lyon: *See*—
Mignien, Georges; and Millet, Christian, 4,217,031, Cl. 350-96.210.

Lessar, Joseph F.: *See*—
Kraska, Robert E.; and Lessar, Joseph F., 4,217,137, Cl. 75-165.000.

Letter, Eugene C.; and Su, Kai C., to Bausch & Lomb Incorporated. Glass coated polysiloxane contact lens. 4,217,038, Cl. 351-160.00R.

Lev, Menashe: *See*—
Kedem, Ora; Kedem, Abraham; Lev, Menashe; Tanny, Gerald B.; and Messalem, Rami, 4,217,200, Cl. 204-301.000.

Levy, Richard H., to Jersey Nuclear-Avco Isotopes, Inc. Isotope separation with improved selective ionization. 4,217,494, Cl. 250-282.000.

Li, James C. M.; and Chu, Sungnee G., to United States of America, Energy. Hemispherical Laue camera. 4,217,493, Cl. 250-272.000.

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Hagedorn, Floyd T.; Rahrig, Donald D.; Revells, Robert G.; and Bushong, James A., 4,217,126, Cl. 65-106.000.

Licentia-Patent Verwaltungs GmbH: *See*—
Fullmann, Marius; Sawitzki, Friedhelm; and Silber, Dieter, 4,217,504, Cl. 307-252.00C.

Lichtinghagen, Klaus: *See*—
Waldhuter, Werner; and Lichtinghagen, Klaus, 4,217,140, Cl. 75-214.000.

Life Savers, Inc.: *See*—
Witzel, Frank; Mackay, Donald A. M.; Bakal, Abraham I.; and Clark, K. Warren, 4,217,368, Cl. 426-5.000.

Liggett Group Inc.: *See*—
Norman, Vello; and Bryant, Herman G., Jr., 4,216,784, Cl. 131-17.00R.

Liller, Delbert I. Continuous method of cleaning a slurry of crushed raw coal. 4,217,207, Cl. 209-13.000.

Lim, Gary M. F.; and Droghini, Roberto D., to Bristol-Myers Company. β-Lactam antibiotic esterification process using methoxymethyl methane sulfonate. 4,217,275, Cl. 260-239.100.

Linde Aktiengesellschaft: *See*—
Heyl, Walter, 4,216,704, Cl. 92-78.000.

Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid aryl esters of polyester-diols lengthened via carbonate groups. 4,217,297, Cl. 260-463.000.

Lindner, Christian: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,217,437, Cl. 528-171.000.

Liotta, F. James: *See*—
Klaus, John F.; and Liotta, F. James, 4,217,652, Cl. 364-601.000.

Lipinski, Richard J., to Mogul Corporation, The. Corrosion inhibiting compositions. 4,217,216, Cl. 210-58.000.

Lipovac, Mile: *See*—
Trp, Peter; Lipovac, Mile; Ribich, Rodolfo J., deceased; and Ribich, Virginia, legal representative, 4,217,062, Cl. 401-44.000.

List, Hans: *See*—
Freyn, Fritz, 4,216,746, Cl. 123-41.690.

Little, Raymond L. Yoke hoist for use with pickup truck. 4,216,941, Cl. 254-326.000.

Litton Systems, Inc.: *See*—
Cross, Joseph E., 4,217,182, Cl. 204-15.000.

Liu, Robert C.: *See*—
Hughes, John L.; Seyler, Jay K.; and Liu, Robert C., 4,217,268, Cl. 260-112.50T.

Livermore, Frederick C.; and Boynton, Robert J., to Northern Telecom Limited. Thermal print bar. 4,217,480, Cl. 219-216.000.

Livick, Lester R. Toy space ship and removable fighter airplane. 4,216,613, Cl. 46-202.000.

Ljungberg, Per-Allan; and Nilsson, Lennart, to Tetra Pak International AB. Arrangement for the processing of a moving material web. 4,217,085, Cl. 425-335.000.

Loblich, Karl-Richard, to Kali and Salz Aktiengesellschaft. Process for the production of potassium magnesium phosphate. 4,217,333, Cl. 423-306.000.

Lodge-Cottrell Limited: *See*—
Wyatt, John G.; and Parker, Kenneth R., 4,216,708, Cl. 98-36.000.

Loersch, Joseph F.: *See*—
Neal, James W.; Loersch, Joseph F.; and Adinolfi, Robert G., 4,217,190, Cl. 204-129.350.

Logabox: *See*—
Flaceliere, Bernard; and Cilesio, Robert, 4,216,719, Cl. 101-227.000.

Loge, Hans, to Kaltenbach & Voight GmbH & Co. Dental handpiece. 4,217,101, Cl. 433-126.000.

Loge, Olaf: *See*—
Vorbrueggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,217,360, Cl. 424-278.000.

Login, Robert B.: *See*—
Newkirk, David D.; and Login, Robert B., 4,217,390, Cl. 428-395.000.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,217,394, Cl. 428-457.000.

Lombardi, Paolo; and Galati, Gaspare. System for the suppression by matching techniques of unwanted echoes in impulse coherent radars. 4,217,584, Cl. 343-7.700.

Lombardino, Joseph G.: *See*—
Harbert, Charles A.; and Lombardino, Joseph G., 4,217,355, Cl. 424-270.000.

Long, Lawrence J.; and Albaric, Jacques E., to Westinghouse Electric Corp. Embedded field winding end turns for dynamoelectric machine rotors. 4,217,515, Cl. 310-270.000.

Long, Thomas R., to Intracoastal Pipe Repair & Supply Co., Inc., a part interest. Pipe inside diameter measurement gauge. 4,216,586, Cl. 33-178.00B.

Longerbeam, Donald A. Apparatus for projecting an image having a convoluted focal plane. 4,217,040, Cl. 353-46.000.

Lonza Ltd.: *See*—
Egli, Rene; Staub, Hans-Rudolf; and Feneberger, Kurt, 4,217,220, Cl. 210-79.000.

Loodberg, Jan A. T.: *See*—
Siwersson, Olle L.; Wall, Arne E.; and Loodberg, Jan A. T., 4,217,109, Cl. 44-1.0SR.

L'Oreal: *See*—
Vanlerberghe, Guy; and Handjani, Rose-Marie, 4,217,344, Cl. 424-60.000.

Lorette, Rene. Parturition warning devices. 4,217,575, Cl. 340-573.000.

Lotte, Andre; and Gross, Raymond, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Installation for the formation of suspended folds in textile strip material. 4,216,888, Cl. 226-104.000.

Louis, Remi: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,217,503, Cl. 307-237.000.

Love, Jim: *See*—
Kyriacou, Demetrios; Edamura, Fred Y.; and Love, Jim, 4,217,185, Cl. 204-73.00R.

Lowenschuss, Oscar, to Raytheon Company. Electronic countermeasure system. 4,217,580, Cl. 343-5.0DP.

LTG Lufttechnische GmbH: *See*—
Furstenberg, Joachim, 4,217,119, Cl. 55-351.000.

Lubbers, Dietrich M.; Baumgartl, Horst; and Saito, Yukio, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V. Instrument for polarographic potentiometric, thermal and like measurements and a method of making the same. 4,217,194, Cl. 204-192.0SP.

Luborsky, Fred E.; and Walter, John L., to General Electric Company. Iron-boron-silicon ternary amorphous alloys. 4,217,135, Cl. 75-123.00L.

Lucas Industries Limited: *See—*
Lakra, Paul, 4,216,754, Cl. 123-447.000.
Ormerod, Alan, 4,216,651, Cl. 60-740.000.
Luigi Stoppani S.p.A.: *See—*
Ghelli, Giovanni, 4,217,457, Cl. 546-320.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., to Beecham Group Limited. Antibacterial compounds. 4,217,447, Cl. 542-426.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., to Beecham Group Limited. Antibacterial compounds. 4,217,448, Cl. 542-427.000.
Lundberg, Richard E.: *See—*
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., 4,217,617, Cl. 361-51.000.
Luthi, Oscar, to Ingersoll-Rand Company. Pulp washer discharging a low consistency pulp slurry. 4,217,170, Cl. 162-380.000.
Lyke, Hiram J. Psychological game apparatus. 4,216,971, Cl. 273-243.000.
Lyster, Edmund F. Crab-snaring device. 4,216,607, Cl. 43-87.000.
Maasberg, Wolfgang: *See—*
Huperz, Adalbert; and Maasberg, Wolfgang, 4,216,911, Cl. 239-526.000.
Mabie, Curtis P.; and Menis, Daniel L., to American Dental Association Health Foundation. Microporous glassy fillers for dental resin composites. 4,217,264, Cl. 260-42.150.
MacChesney, John B.; and O'Connor, Paul B., to Bell Telephone Laboratories, Incorporated. Optical fiber fabrication and resulting product. 4,217,027, Cl. 350-96.300.
MacGregor, Stuart; and Berry, Peter J., to Barr & Stroud Limited. Radiation scanning system. 4,217,608, Cl. 358-113.000.
Machanian, William V.; Ippolito, Anthony C.; and Hoskinson, William R., to Wurlitzer Company, The. Means for storing bass rhythm patterns. 4,216,693, Cl. 84-1.030.
Machida Endoscope Co., Ltd.: *See—*
Aoshiro, Hisatake, 4,216,767, Cl. 128-6.000.
Machida, Yoshio: *See—*
Sakai, Atsushi; Yamaguchi. Fumiaki; Kawazoe, Tetsu; Yonemori, Hayato; and Machida, Yoshio, 4,217,204, Cl. 208-125.000.
Machuque, Jean H. J., to Diepal Corporation. Extrusion head. 4,217,083, Cl. 425-198.000.
Mack, Grant V., to Reynolds International, Inc. Support member and method of manufacture. 4,216,632, Cl. 52-40.000.
Mackay, Donald A. M.: *See—*
Witzel, Frank; Mackay, Donald A. M.; Bakal, Abraham I.; and Clark, K. Warren, 4,217,368, Cl. 426-5.000.
Macnair, Richard N.: *See—*
Arons, Gilbert N.; and Macnair, Richard N., 4,217,386, Cl. 428-198.000.
MacRae, Thomas H. Board game simulating drunk driving. 4,216,966, Cl. 273-243.000.
Maggioni, Paolo; Mauri, Francesco; and Citterio, Attilio, to Brichima S.p.A. Process for preparing bifunctional aliphatic organic compounds. 4,217,290, Cl. 260-404.000.
Magladry, Ross E.: *See—*
O'Boyle, Matthew; Schneider, Alan A.; and Magladry, Ross E., 4,217,403, Cl. 429-162.000.
Magna Corporation: *See—*
Blair, Jr.; Charles M., 4,216,828, Cl. 166-274.000.
Magnotta, Frank A., to Dennison Manufacturing Company. Chemically-resistant adhesives and labels. 4,217,263, Cl. 260-29.800.
Maikowski, Michael: *See—*
Dietz, Erwin; Fuchs, Otto; Gutbrod, Robert; Kroh, Adolf; and Maikowski, Michael, 4,217,265, Cl. 260-42.210.
Main, John A., to Kelsey Hayes Co. Wheel trim attachment. 4,217,003, Cl. 301-37.00S.
Maire, Bernard, to Ebauches SA. System for detecting the end useful life of a battery in an electronic time-piece. 4,216,648, Cl. 368-66.000.
Maire, Jacques; Fourre, Jacques; Soisy sous Montmorency; and Gervais, Jean P., to Le Carbone-Lorraine. Artificial graphite. 4,217,336, Cl. 423-448.000.
Malone, James P. Guard means for rotary mowers. 4,216,643, Cl. 56-320.100.
Malsot, Christian: *See—*
Jacques, Andre; Malsot, Christian; Moronvalle, Chantal; and Bertau, Edith, 4,217,084, Cl. 425-321.000.
Mann, Horace C., Jr.: *See—*
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., 4,217,128, Cl. 71-29.000.
Manowitz, Milton: *See—*
Brandman, Harold A.; Manowitz, Milton; and Coffen, David L., 4,217,363, Cl. 424-320.000.
Marcilly, Christian; Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, to Societe Francaise des Products pour Catalyse. Catalysts for hydrocarbon conversion. 4,217,205, Cl. 208-139.000.
Markezich, Ronald L.; and Takekoshi, Tohru, to General Electric Company. Imide carbonyl compounds and method for making. 4,217,281, Cl. 260-326.00A.
Marse, Salvador. President election game. 4,216,967, Cl. 273-257.000.
Marsh, Walter H.; Beckerman, Howard L.; and Dob, Allan M., to Singer Company, The. Optical switching design for one step buttonholing. 4,216,732, Cl. 112-158.00B.
Marsili, Leonardo: *See—*
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,276, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,277, Cl. 260-239.30P
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,278, Cl. 260-239.30P.
Martec Industries Inc.: *See—*
Shreve, Marshall T., 4,216,980, Cl. 285-13.000.
Martelli, Emilio. Coding and decoding apparatus for the protection of communication secrecy. 4,217,469, Cl. 179-1.50R.
Martin, Kenneth E. Directional tree falling aid and method of applying same. 4,216,940, Cl. 254-390.000.
Martin Marietta Corporation: *See—*
Hall, Charles A., 4,216,803, Cl. 138-144.000.
Martino, Germain: *See—*
Marcilly, Christian; Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,217,205, Cl. 208-139.000.
Martins, Joseph G.: *See—*
Donermeyer, Donald D.; and Martins, Joseph G., 4,217,376, Cl. 427-142.000.
Maruhashi, Yoshitsugu: *See—*
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
Marvin Glass & Associates: *See—*
Erickson, Erick E.; Wildman, John R.; Meyer, Burton C.; and Burck, Joseph M., 4,216,612, Cl. 46-103.000.
Ferris, Michael J., 4,216,610, Cl. 46-44.000.
Morrison, Howard J.; Baer, Ralph H.; and Breslow, Jeffrey D., 4,216,965, Cl. 273-237.000.
Marziano, Samuel J.; and Donnard, Reed E., to United States of America, Army. Thermite penetrator device (U). 4,216,721, Cl. 102-90.000.
Maschinefabrik Augsburg-Nuenberg Aktiengesellschaft: *See—*
Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, 4,216,684, Cl. 74-751.000.
Masdin, Edward G.: *See—*
Verschuur, Eke; and Masdin, Edward G., 4,217,110, Cl. 44-51.000.
Mason, Richard K.: *See—*
Joshi, Madhukar L.; Mason, Richard K.; and Pricer, Wilbur D., 4,216,573, Cl. 29-571.000.
Mason, Ronald F.; and Devlin, Barry R. J., to Shell Oil Company. 3-Azabicyclo(3.1.0)hexan-4-one-2-carbonitrile. 4,217,283, Cl. 260-326.50B.
Mason, W. Alfred; and Gerry, Kenneth L. Steady rest. 4,216,950, Cl. 269-271.000.
Massachusetts Institute of Technology: *See—*
Suh, Nam P.; Fillion, Paul D.; and Lee, Sang H., 4,217,113, Cl. 51-309.000.
Massey-Ferguson Services N.V.: *See—*
Fischer, Karl-Heinz; and Perkert, Rudolf, 4,217,063, Cl. 403-37.000.
Masso, Joseph I. Oil refining apparatus. 4,217,221, Cl. 210-168.000.
Masson, Louis, to Hydro-Quebec. Circuit for controlling induction in current transformers. 4,217,620, Cl. 361-58.000.
Masui, Takatoshi: *See—*
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, 4,216,753, Cl. 123-445.000.
Mathieu, Alain, to Lafarge Fondu International. High alumina refractory cement and a process for producing the same. 4,217,144, Cl. 106-104.000.
Matla, Arno; and Zimmermann, Volker, to International Business Machines Corporation. Servo system for track accessing and track following in a disk drive. 4,217,612, Cl. 360-78.000.
Matsubara, Sigeo; and Tsuda, Tatsuya, to Sharp Kabushiki Kaisha. Food temperature control in a microwave oven. 4,217,477, Cl. 219-10.55B.
Matsukuma, Ikuo: *See—*
Tsuruta, Teruyuki; Kawai, Masanobu; Matsukuma, Ikuo; Teranishi, Masayuki; and Nakamizo, Nobuhiro, 4,217,130, Cl. 71-95.000.
Matsumoto, Shigeo; Tago, Koichi; and Kato, Hidetoshi, to Sony Corporation. Cathode ray tube and a ventilator used in its baking process. 4,217,015, Cl. 316-30.000.
Matsumoto, Shuichi: *See—*
Nakamura, Ryuichi; Fukuhara, Seiji; Matsumoto, Shuichi; and Komatsu, Koei, 4,217,299, Cl. 260-464.000.
Matsumura, Kazuhiro: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,217,432, Cl. 526-119.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Nakamura, Kansei; Kusumoto, Hikoichi; and Yokono, Yoshinobu, 4,217,525, Cl. 315-381.000.
Nishino, Atsushi; and Yoshida, Akihiko, 4,217,623, Cl. 361-286.000.
Matsushita Electric Works, Ltd.: *See—*
Yamamura, Yukio; Ichinomiya, Tsutomu; and Ishimaru, Shinichi, 4,216,956, Cl. 272-70.000.
Yoshida, Makoto; Nagashima, Nobutsugu; Suzue, Akihiro; Kitagawa, Ryuichi; and Namikawa, Misao, 4,217,018, Cl. 339-21.00R.
Matsushita, Takeshi; Ida, Jinsei; and Otsuka, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Replaceable gang head machine tool. 4,216,572, Cl. 29-568.000.
Mauri, Francesco: *See—*
Maggioni, Paolo; Mauri, Francesco; and Citterio, Attilio, 4,217,290, Cl. 260-404.000.
Mauron, Gerard, to Automobiles Peugeot; and Societe Anonyme Automobiles Citroen. Automatically positioned safety belt for an automobile vehicle. 4,216,978, Cl. 280-803.000.
Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.V.: *See—*
Lubbers, Dietrich M.; Baumgartl, Horst; and Saito, Yukio, 4,217,194, Cl. 204-192.0SP.

Mayne, John E. O.; and Heyes, Peter J., to National Research Development Corporation. Metal coating compositions. 4,217,142, Cl. 106-14.360.

McAleer, William J.; and Hurni, William M., to Merck & Co., Inc. Recovery of small particles by flow centrifugation. 4,217,418, Cl. 435-239.000.

McCallin Steel Storage Systems, Inc.: *See*—
Fahey, Thomas D.; and McGannon, George P., 4,216,866, Cl. 211-1.500.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Rapid filtration of ethylene-vinyl ester interpolymer particles from aqueous dispersions thereof. 4,217,423, Cl. 525-62.000.

McConnell, Richard L.; and Weemes, Doyle A., to Eastman Kodak Company. Polyester/low-viscosity polyethylene melt blends for powder adhesives or powder coating materials. 4,217,426, Cl. 525-173.000.

McConnell, Richard L.; Weemes, Doyle A.; and Joyner, Frederick B., to Eastman Kodak Company. Blends of substantially amorphous higher 1-olefin copolymers and tackifying resins useful as pressure-sensitive adhesives. 4,217,428, Cl. 525-191.000.

McConnell, Richard L.; and Weemes, Doyle A., to Eastman Kodak Company. Adhesive composition. 4,217,435, Cl. 525-425.000.

McCord Corporation: *See*—
Colby, Daniel E., 4,217,325, Cl. 264-245.000.

McCoy, John W., to Avon Products, Inc. Feeding apparatus with engaged/disengaged transport mechanism. 4,216,854, Cl. 198-481.000.

McCullough, John F.: *See*—
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., 4,217,128, Cl. 71-29.000.

McCutchen, James V.: *See*—
Gould, John S.; Winquist, Roger D.; Eve, William R., IV; McCutchen, James V.; Pelcher, Anthony M.; and Watson, Richard E., 4,216,839, Cl. 180-65.00R.

McDaniel, Ollie F., Jr., to WWG Industries, Inc. Multi-colored tufted carpet and method of producing same. 4,216,735, Cl. 112-410.000.

McDonnell Douglas Corporation: *See*—
Hayase, Masashi; Ecklund, Richard C.; Walkington, Robert J.; Hughes, James B.; and Williams, Neil R., 4,217,397, Cl. 428-594.000.
Klein, Herman C., 4,217,625, Cl. 362-30.000.

McGannon, George P.: *See*—
Fahey, Thomas D.; and McGannon, George P., 4,216,866, Cl. 211-1.500.

McGraw-Edison Company: *See*—
Wadia, Gurinder S., 4,217,482, Cl. 219-494.000.

McGuffin, August L., to General Electric Company. Channel estimating reference signal processor for communication system adaptive antennas. 4,217,586, Cl. 343-100.0LE.

McInerny, George P., to Technitrol, Inc. Feed mechanism for sequentially separating documents, sheets, coupons and the like. 4,216,952, Cl. 271-10.000.

McKelvey, Kay. Portable ski/pole lock and carrying apparatus. 4,216,665, Cl. 70-58.000.

McMillin, John R., to Cornelius Company, The. Method of and apparatus for dispensing a high volumetric flow rate of carbonated beverage, having partial reversal of a circulating flow. 4,216,879, Cl. 222-1.000.

McNinch, Delmar; and Schuttler, William K., to Lawrence Brothers, Inc. Releasable door stop assembly. 4,216,986, Cl. 292-341.170.

McQuillan, Mary J. Table baseball apparatus. 4,216,961, Cl. 273-89.000.

McRae, Wayne A., to Ionics Inc. Process for chloro-alkali electrolysis cell. 4,217,186, Cl. 204-98.000.

McVicker, Gary B., to Exxon Research & Engineering Co. Supported heteronuclear noble metal cluster catalysts and method for preparing same. 4,217,249, Cl. 252-466.0PT.

Mead Corporation, The: *See*—
Oliff, James R., 4,216,861, Cl. 206-427.000.

Medica, Joseph J.; and Hahn, William T., to Celotex Corporation, The. Process for producing a raised embossed effect. 4,217,380, Cl. 427-287.000.

Medtronic, Inc.: *See*—
Kraska, Robert E.; and Lessar, Joseph F., 4,217,137, Cl. 75-165.000.

Meece, Kermit A.; and Taylor, Thomas S., to International Business Machines Corporation. Method and apparatus for determining the velocity of a liquid stream of droplets. 4,217,594, Cl. 346-75.000.

Meek, Lennis E., to Dayco Corporation. Process for molding antifriction nylon member. 4,217,324, Cl. 264-236.000.

Megatech Corporation: *See*—
Basmajian, Vahan V.; and Haldeman, Charles W., 4,216,593, Cl. 35-10.000.

Meier, Hans-Anton, to Swiss Aluminium Ltd. Inductor for an electromagnetic mold for continuous casting. 4,216,817, Cl. 164-147.000.

Meissner, J. Michael; and Fyler, Norman F. Digitized distance measuring device. 4,216,584, Cl. 33-143.00L.

Mekkelholt, Petrus J. M.: *See*—
Viezee, Dirk J.; Mekkelholt, Petrus J. M.; and Juijn, Johannes A., 4,217,387, Cl. 428-288.000.

Melcher, Robert L.; and von Gutfeld, Robert J., to International Business Machines Corporation. Method for locally enhancing electroplating rates. 4,217,183, Cl. 204-15.000.

Melnik, Alla N.: *See*—
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.

Melzer, Werner; Jaenicke, Dieter; and Schroeder, Helmut, to Hoechst Aktiengesellschaft. Process for the quantitative determination of the carbon of organic compounds in water. 4,217,108, Cl. 23-230.0PC.

Mendiberri, Vicente. Helicopter of the type having two coaxial counterrotating rotors with a drive mechanism interposed between the power plant and the rotors. 4,216,925, Cl. 244-60.000.

Menis, Daniel L.: *See*—
Mabie, Curtis P.; and Menis, Daniel L., 4,217,264, Cl. 260-42.150.

MenMuir, Paul C.: *See*—
Bonnes, Eugene D.; Kotian, Vijayraj M.; and MenMuir, Paul C., 4,216,802, Cl. 138-143.000.

Mentz, Bernardus J.: *See*—
Tufts, Lewis E.; and Mentz, Bernardus J., 4,217,187, Cl. 204-98.000.

Merck & Co., Inc.: *See*—
Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., 4,217,453, Cl. 544-373.000.
McAleer, William J.; and Hurni, William M., 4,217,418, Cl. 435-239.000.
Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., 4,217,352, Cl. 424-256.000.
Tobert, Jonathan A., 4,217,340, Cl. 424-157.000.
Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, 4,217,429, Cl. 525-411.000.

Merker, Paul: *See*—
Hagin, Faust; Hagen, Hans; Drewitz, Hans-Jurgen; Knirsch, Erich; and Merker, Paul, 4,216,684, Cl. 74-751.000.

Messalem, Rami: *See*—
Kedem, Ora; Kedem, Abraham; Lev, Menashe; Tanny, Gerald B.; and Messalem, Rami, 4,217,200, Cl. 204-301.000.

Metropolitan Sanitary District of Greater Chicago: *See*—
Kurland, Jerome J., 4,216,671, Cl. 73-61.00R.

Meyer, Burton C.: *See*—
Erickson, Erick E.; Wildman, John R.; Meyer, Burton C.; and Burck, Joseph M., 4,216,612, Cl. 46-103.000.

Meyer-Simon, Eugen: *See*—
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,217,334, Cl. 423-342.000.

Michaelis, Peter, to Ciba-Geigy Corporation. Epithio compounds as additives for lubricants. 4,217,233, Cl. 252-48.200.

Michalski, Thomas F., to Owens-Illinois, Inc. Clock circuit having a swept output frequency. 4,217,655, Cl. 364-701.000.

Michigan State University: *See*—
Kabara, Jon J., 4,217,364, Cl. 424-320.000.

Micro-Mega S.A.: *See*—
Garnier, Marcel, 4,217,098, Cl. 433-147.000.

Miertschin, Gary N.: *See*—
Leary, David F.; Cooper, Roy G.; and Miertschin, Gary N., 4,217,174, Cl. 176-82.000.

Mignien, Georges; and Millet, Christian, to Les Cables de Lyon. Mechanical device for connecting optical fibres. 4,217,031, Cl. 350-96.210.

Miklas, Frank C., to General Electric Company. Toaster/oven accessory pan with handle. 4,216,763, Cl. 126-275.00R.

Milkovic, Miran, to General Electric Company. Electronic energy consumption meter and system with automatic error correction. 4,217,546, Cl. 324-142.000.

Miller, Charles H.: *See*—
Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., 4,217,385, Cl. 428-159.000.

Miller, Fred L.: *See*—
Erickson, William V.; Jarvie, Paul K.; and Miller, Fred L., 4,216,785, Cl. 131-173.000.

Miller, Fred Lynn: *See*—
Erickson, William V.; Jarvie, Paul K.; and Miller, Fred L., 4,216,785, Cl. 131-173.000.

Miller, Gary K.: *See*—
Kuck, Mark A.; and Miller, Gary K., 4,217,184, Cl. 204-59.0QM.

Miller, Gerald W.: *See*—
Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., 4,217,327, Cl. 264-293.000.

Miller, Joseph: *See*—
Aprahamian, Robert; and Miller, Joseph, 4,217,558, Cl. 331-94.50C.

Miller, Robert E.: *See*—
Glanz, Kenneth D.; Becker, William J.; and Miller, Robert E., 4,217,162, Cl. 156-305.000.

Miller, Sammy L.; and Kindig, Alan L., to General Electric Company. Methods and apparatus for inserting winding end turn phase insulation. 4,216,571, Cl. 29-596.000.

Millet, Christian: *See*—
Mignien, Georges; and Millet, Christian, 4,217,031, Cl. 350-96.210.

Minagawa, Motonobu; Sekiguchi, Tetsuo; and Nakazawa, Kenji, to Argus Chemical Corp. Stabilized halogen-containing resin composition. 4,217,258, Cl. 260-23.0XA.

Minalga, Philip F., to Singer Company, The. Digitally controlled gain reduction in a positioning system. 4,217,531, Cl. 318-677.000.

Minemura, Norimichi: *See*—
Kono, Hisashi; Nakai, Shigeyuki; Hisadomi, Masaki; Minemura, Norimichi; Okita, Tetsuo; and Kawamura, Sigeru, 4,217,127, Cl. 71-28.000.

Ministry of International Trade & Technology: *See*—
Komoriya, Kiyoshi, 4,216,701, Cl. 91-49.000.

Minolta Camera Kabushiki Kaisha: *See*—
Egawa, Takeshi, 4,217,048, Cl. 354-155.000.
Yamazaki, Keiji; Egawa, Takeshi; Yamazaki, Yasuo; and Ueda, Hiroshi, 4,217,044, Cl. 354-54.000.

Miquel, Jean: *See—*
Marcilly, Christian; Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,217,205, Cl. 208-139.000.

Miracle Core Chemical Industries: *See—*
Jacobson, Albert; and Moskovitz, Solomon, 4,217,225, Cl. 210-236.000.

Mirtain, Henri J.: *See—*
Grosch, Karl A.; Mirtain, Henri J.; Devienne, Andre M.; and Trzepaez, Jean, 4,216,814, Cl. 152-362.00R.

Mitsubishi Chemical Industries, Ltd.: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, 4,217,366, Cl. 424-330.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, 4,216,892, Cl. 228-44.10R.
Fukunaga, Shinobu; and Yasuoka, Akihiko, 4,217,153, Cl. 148-187.000.

Mitsui, Akio: *See—*
Nakamura, Kotaro; and Mitsui, Akio, 4,217,410, Cl. 430-546.000.

Mitsui Engineering and Shipbuilding Co., Ltd.: *See—*
Sakai, Atsushi; Yamaguchi, Fumiaki; Kawazoe, Tetsu; Yonemori, Hayato; and Machida, Yoshio, 4,217,204, Cl. 208-125.000.

Mitsui Petrochemical Industries Ltd.: *See—*
Sakai, Atsushi; Yamaguchi, Fumiaki; Kawazoe, Tetsu; Yonemori, Hayato; and Machida, Yoshio, 4,217,204, Cl. 208-125.000.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.

Mitsuyasu, Masaki: *See—*
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, 4,216,753, Cl. 123-445.000.

Miyamoto, Akira: *See—*
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.

Miyazaki, Joichi: *See—*
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,216,646, Cl. 368-28.000.

Miyazaki, Wasei: *See—*
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,217,345, Cl. 424-180.000.

Mizuki, Eiichi: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; Kawano, Hideo; and Fujiwara, Tadahiro, 4,217,408, Cl. 430-205.000.

Mizuno, Hideaki; and Terawaki, Susumu, to Victor Company of Japan, Limited. Cermet type magnetic material. 4,217,151, Cl. 148-31.550.

Mizutani, Hiroshi: *See—*
Tsuchiya, Yoshimi; and Mizutani, Hiroshi, 4,216,772, Cl. 128-284.000.

Mobay Chemical Corporation: *See—*
Szabat, John F.; Baumann, Gert F.; and Copeland, Gaeta L., 4,217,247, Cl. 252-431.00C.

Mobil Oil Corporation: *See—*
Braid, Milton, 4,217,232, Cl. 252-46.400.
Glenn, Edwin E., Jr., 4,217,659, Cl. 367-35.000.

Mochizuki, Koichi: *See—*
Hirano, Reiji; Mochizuki, Koichi; Yasui, Tokio; and Shimazu, Jyoji, 4,217,656, Cl. 364-710.000.

Moea, Victor. Hair waving assembly. 4,216,787, Cl. 132-39.000.

Mogi, Takao; Morita, Koji; and Okada, Hisao, to Sony Corporation. Receiver. 4,217,552, Cl. 455-164.000.

Mogolesko, Paul D.: *See—*
Bernady, Karel F.; and Mogolesko, Paul D., 4,217,308, Cl. 260-583.00P.

Mogul Corporation, The: *See—*
Lipinski, Richard J., 4,217,216, Cl. 210-58.000.

Mohasco Corporation: *See—*
Holobaugh, Raymond, 4,216,991, Cl. 297-85.000.

Mojonnier Bros. Co.: *See—*
Skoli, Sigmund P.; and Mojonnier, Harry G., 4,216,711, Cl. 99-277.200.

Mojonnier, Harry G.: *See—*
Skoli, Sigmund P.; and Mojonnier, Harry G., 4,216,711, Cl. 99-277.200.

Molins Limited: *See—*
Davies, Robert W., 4,216,898, Cl. 229-44.0CB.

Moller, Rolf: *See—*
Goedecke, Ralf; Kurandt, Uwe; and Moller, Rolf, 4,217,451, Cl. 544-190.000.

Molls, Hans-Heinz: *See—*
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.

Molten Steel Products, Inc.: *See—*
Russell, Robert E., 4,217,134, Cl. 75-58.000.

Momose, Haruhiko; Yamada, Masashi; and Iijima, Yaichi, to Konishiroku Photo Industry Co., Ltd. Camera having an automatic focus control apparatus. 4,217,043, Cl. 354-25.000.

Monosolar Inc.: *See—*
Rod, Robert L.; Penick, Walter J.; and Dobson, Rodney J., 4,217,402, Cl. 429-111.000.

Monsanto Company: *See—*
Campbell, William L., 4,217,321, Cl. 264-168.000.
Dobo, Emerick J., 4,217,399, Cl. 428-679.000.
Donermeyer, Donald D.; and Martins, Joseph G., 4,217,376, Cl. 427-142.000.

Montgomery, Dean P., to Phillips Petroleum Company. Regeneration of isomerization catalysts containing magnesium oxide. 4,217,244, Cl. 252-419.000.

Moog GmbH: *See—*
Handte, Herbert; and Kollmar, Friedrich, 4,217,635, Cl. 364-117.000.

Mookherjee, Braja D.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.

Moon, George D., Jr.: *See—*
Katzen, Raphael; Moon, George D., Jr.; and Kumana, Jimmy D., 4,217,178, Cl. 203-19.000.

Moon, S. David, to Qume Corporation. Daisy wheel printer which accommodates different print wheel fonts. 4,217,055, Cl. 400-144.200.

Moore, James W., to Pfizer Inc. ωAmino-2-hydroxyalkyl derivatives of aminoglycoside antibiotics. 4,217,446, Cl. 536-10.000.

Moore, Royston: *See—*
Hall, Charles E.; and Moore, Royston, 4,216,717, Cl. 101-123.000.

Moreau, Rene J.: *See—*
Garnier, Marcel A.; and Moreau, Rene J., 4,216,800, Cl. 137-807.000.

Mori, Shigeo: *See—*
Hara, Yoshiaki; Mori, Shigeo; Murakami, Fumikazu; Horikoshi, Ichiro; and Takahasai, Soya, 4,216,650, Cl. 368-72.000.

Mori, Yasuo; and Hijikata, Kunio, to Tokyo Institute of Technology. Coolant system and cooling method utilizing two-phase flow for nuclear fusion reactor. 4,217,172, Cl. 176-9.000.

Morikawa, Osamu: *See—*
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.

Moring, Peter L. E.; and Biggs, Ian, to Dunlop Limited. Reinforcement for elastomeric articles. 4,216,856, Cl. 198-847.000.

Morino, Yukio: *See—*
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Nemoto, Ichiro, 4,217,049, Cl. 354-195.000.

Morio, Yasumasa: *See—*
Ikegami, Kouzaburo; Morio, Yasumasa; and Sakai, Hitoshi, 4,217,060, Cl. 401-265.000.

Morisawa, Kazuo; and Nagele, Rudolf. Apparatus for adjusting the slide stroke of a press machine. 4,216,681, Cl. 74-571.00M.

Morita, Koji: *See—*
Mogi, Takao; Morita, Koji; and Okada, Hisao, 4,217,552, Cl. 455-164.000.

Moritz, Frederick G.: *See—*
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,216,889, Cl. 226-118.000.

Moronvalle, Chantal: *See—*
Jacques, Andre; Malsot, Christian; Moronvalle, Chantal; and Bertau, Edith, 4,217,084, Cl. 425-321.000.

Morrison, Howard J.; Baer, Ralph H.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Microcomputer controlled electronic game apparatus. 4,216,965, Cl. 273-237.000.

Mortellite, Robert M.: *See—*
Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., 4,217,327, Cl. 264-293.000.

Morton-Norwich Products, Inc.: *See—*
Pelosi, Stanford S., Jr.; White, Ronald E.; Wright, George C.; and Yu, Chia N., 4,217,286, Cl. 260-347.700.

Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., to Potter Instrument Company, Inc. Vacuum tank for magnetic tape handlers. 4,216,889, Cl. 226-118.000.

Mosetti, Jacques: *See—*
Doniat, Denis; Corajoud, Jean-Michel; Mosetti, Jacques; and Porta, Augusto, 4,217,191, Cl. 204-130.000.

Moskovitz, Solomon: *See—*
Jacobson, Albert; and Moskovitz, Solomon, 4,217,225, Cl. 210-236.000.

Moss, Owen R., to Hazleton Systems, Inc. Exposure chamber. 4,216,741, Cl. 119-15.000.

Motorola, Inc.: *See—*
En, John, 4,217,660, Cl. 371-44.000.

Muhr, Karl-Heinz; and Willwacher, Horst, to Muhr und Bender. Clip-type rail fastener. 4,216,905, Cl. 238-349.000.

Muhr und Bender: *See—*
Muhr, Karl-Heinz; and Willwacher, Horst, 4,216,905, Cl. 238-349.000.

Mukai, Cromwell D , to Polychrome Corporation. Process for preparing an improved anti-oxidant gum composition for lithographic plates. 4,217,242, Cl. 252-389.00A.

Mullerheim, Steven B.; and Williams, Fred G., Jr., to Great Circle Associates. Sewage delivery and filtration system. 4,217,219, Cl. 210-65.000.

Mundus, Friedhelm: *See—*
Achelpohl, Fritz; and Mundus, Friedhelm, 4,216,705, Cl. 93-33.00H.

Mura, Richard J., to Outboard Marine Corporation. Voltage regulated magneto powered capacitive discharge ignition system. 4,216,756, Cl. 123-597.000.

Murakami, Fumikazu: *See—*
Hara, Yoshiaki; Mori, Shigeo; Murakami, Fumikazu; Horikoshi, Ichiro; and Takahasai, Soya, 4,216,650, Cl. 368-72.000.

Murakawa, Kyohei: *See*—
Yamada, Seiichi; Kamehara, Nobuo; and Murakawa, Kyohei, 4,217,337, Cl. 423-626.000.
Murao, Yutaka: *See*—
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,217,638, Cl. 364-200.000.
Murata, Kazuo; and Kuroda, Kotofusa, to Yuasa Battery Company Limited. Storage battery plate wrapping machine. 4,216,579, Cl. 29-730.000.
Muraviev, Alexandr P.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Murenbeeld, Karel: *See*—
Foster, Peter W.; Berry, Thomas; and Murenbeeld, Karel, 4,217,323, Cl. 264-235.000.
Murphey, Joseph R., to Halliburton Company. Gelled water epoxy sand consolidation system. 4,216,829, Cl. 166-276.000.
Murrell, Thomas A.: *See*—
Henry, Donald E.; Murrell, Thomas A.; Schilt, Marvin H.; and Weaver, Alfred C., 4,217,658, Cl. 364-900.000.
Murtha, Timothy P., to Phillips Petroleum Company. Hydroalkylation catalyst composition comprising a rhenium, nickel, rare earth zeolite. 4,217,248, Cl. 252-455.00Z.
Musgrave, Daniel D. Magazine status indicating process. 4,216,601, Cl. 42-1.00B.
Musgrove, Donovon E.; Vos, Wilbur D.; and Valintine, Lyle D. Waterproof truck bed cover. 4,216,990, Cl. 296-213.000.
Muta, Natsuo, to Kabushiki Kaisha Kankyo Kaihatsu. Method of renewing water pipe, including coating thereof, and apparatus therefor. 4,216,738, Cl. 118-72.000.
Mutz, Michael J.: *See*—
Starkweather, Howard W., Jr.; and Mutz, Michael J., 4,217,430, Cl. 525-183.000.
Nagae, Akira: *See*—
Aoki, Kazuhide; Kawagai, Kenji; Nagae, Akira; and Goto, Shuichi, 4,217,505, Cl. 307-273.000.
Nagai, Hiroshi: *See*—
Hayashi, Tetsuaki; Shiiyama, Hideo; Kinoshita, Mikio; and Nagai, Hiroshi, 4,216,680, Cl. 74-473.00R.
Nagakura, Masahiko: *See*—
Yamada, Shun-ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,217,284, Cl. 260-343.30P.
Nagashima, Nobutsugu: *See*—
Yoshida, Makoto; Nagashima, Nobutsugu; Suzue, Akihiro; Kitagawa, Ryuichi; and Namikawa, Misao, 4,217,018, Cl. 339-21.00R.
Nagata, Kunio; and Ohashi, Yasuo, to Omron Tateisi Electronics Co. Temperature detecting device. 4,216,675, Cl. 73-362.0AR.
Nagele, Rudolf: *See*—
Morisawa, Kazuo; and Nagele, Rudolf, 4,216,681, Cl. 74-571.00M.
Naito, Junichiro: *See*—
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,216,653, Cl. 60-276.000.
Nakagawa, Tadashi; and Nemoto, Ichiro, to Seiko Koki Kabushiki Kaisha. Exposure time setting device for shutter of camera. 4,217,051, Cl. 354-226.000.
Nakai, Shigeyuki: *See*—
Kono, Hisashi; Nakai, Shigeyuki; Hisadomi, Masaki; Minemura, Norimichi; Okita, Tetsuo; and Kawamura, Sigeru, 4,217,127, Cl. 71-28.000.
Nakamizo, Nobuhiro: *See*—
Tsuruta, Teruyuki; Kawai, Masanobu; Matsukuma, Ikuo; Teranishi, Masayuki; and Nakamizo, Nobuhiro, 4,217,130, Cl. 71-95.000.
Nakamura, Kansei; Kusumoto, Hikoichi; and Yokono, Yoshinobu, to Matsushita Electric Industrial Co., Ltd. Spot killer circuit. 4,217,525, Cl. 315-381.000.
Nakamura, Kotaro; and Mitsui, Akio, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive materials with phosphate solvent. 4,217,410, Cl. 430-546.000.
Nakamura, Osamu, to Kabushiki Kaisha Suwa Seikosha. Printer paper feed assembly including means for facilitating manual paper advance. 4,217,057, Cl. 400-636.000.
Nakamura, Ryuichi; Fukuhara, Seiji; Matsumoto, Shuichi; and Komatsu, Koei, to Japan Synthetic Rubber Co., Ltd. Method for converting unsaturated compound having functional group. 4,217,299, Cl. 260-464.000.
Nakanishi, Hiromasa: *See*—
Ikenishi, Masataka; Miyazaki, Joichi; Kushida, Shozo; and Nakanishi, Hiromasa, 4,216,646, Cl. 368-28.000.
Nakano, Yoshimasa: *See*—
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,217,345, Cl. 424-180.000.
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, to Nippon Soken, Inc. Exhaust gas purifying system for internal combustion engines. 4,216,653, Cl. 60-276.000.
Nakata, Shinichi, to Canon Kabushiki Kaisha. Electronic apparatus for time calculation. 4,217,653, Cl. 364-705.000.
Nakauchi, Hiroshi: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Inami, Yasuhiko; and Uede, Hisashi, 4,217,579, Cl. 340-763.000.
Nakaya, Keiichi; Sato, Kimihiko; and Konishi, Kenji, to Asahi Glass Company, Limited. Apparatus for production of sodium bicarbonate. 4,217,330, Cl. 422-193.000.
Nakayama, Yoshiro: *See*—
Okuyama, Yasuhiko; Tanaka, Koji; Nakayama, Yoshiro; and Kato, Hiroshi, 4,216,692, Cl. 84-1.010.
Nakazawa, Kenji: *See*—
Minagawa, Motonobu; Sekiguchi, Tetsuo; and Nakazawa, Kenji, 4,217,258, Cl. 260-23.0XA.
Nalco Chemical Company: *See*—
Ballweber, Edward G.; Jansma, Roger H.; and Phillips, Kenneth G., 4,217,425, Cl. 525-155.000.
Namikawa, Misao: *See*—
Yoshida, Makoto; Nagashima, Nobutsugu; Suzue, Akihiro; Kitagawa, Ryuichi; and Namikawa, Misao, 4,217,018, Cl. 339-21.00R.
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, to Tokyo Shibaura Electric Co., Ltd. Data-processing apparatus and method. 4,217,638, Cl. 364-200.000.
Naparstek, Abraham, to U.S. Philips Corporation. Correction for polychromatic X-ray distortion in CT images. 4,217,641, Cl. 364-414.000.
Nara, Munehiko: *See*—
Yamada, Shun-ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,217,284, Cl. 260-343.30P.
Nashville Wire Products Manufacturing Co., Inc.: *See*—
Schrader, Donald E., 4,216,729, Cl. 108-159.000.
National Computer Systems, Inc.: *See*—
Kjeer, Clayton P., 4,217,487, Cl. 235-468.000.
National Distillers and Chemical Corporation: *See*—
McClain, Dorothee M., 4,217,423, Cl. 525-62.000.
Swearingen, Saxon B., 4,217,463, Cl. 136-232.000.
National Research Development Corporation: *See*—
Fray, Derek J., 4,217,179, Cl. 204-1.00T.
Gurr, William R., 4,217,181, Cl. 204-1.500.
Mayne, John E. O.; and Heyes, Peter J., 4,217,142, Cl. 106-14.360.
Naud, Gaetan. Bingo chip dispenser. 4,216,878, Cl. 221-264.000.
Neal, James W.; Loersch, Joseph F.; and Adinolfi, Robert G., to United Technologies Corporation. Method and apparatus for electrochemically finishing airfoil edges. 4,217,190, Cl. 204-129.350.
Nebeling, Reinhard: *See*—
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.
Neill, Daniel L., to Kelsey Hayes Co. Electromagnets for brakes and clutches. 4,216,849, Cl. 188-138.000.
Nejedly, Peter; and Whitfield, Douglas W., to Canada, Atomic Energy of, Limited. Three dimensional strain gage transducer. 4,217,569, Cl. 338-2.000.
Nelson, Norman A. System for connecting an underwater platform to an underwater floor. 4,216,835, Cl. 175-10.000.
Nemoto, Ichiro: *See*—
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Nemoto, Ichiro, 4,217,049, Cl. 354-195.000.
Nakagawa, Tadashi; and Nemoto, Ichiro, 4,217,051, Cl. 354-226.000.
Nepein, Valery N.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.
Nettler, Hubert: *See*—
Sieweke, Wilhelm; Nettler, Hubert; and Burmann, Jurgen, 4,216,946, Cl. 266-87.000.
Neu, Francis, to S.A. Delta Neu. Cooling tower with vertical-axis fan. 4,217,317, Cl. 261-160.000.
Neufeld, Sidney B.: *See*—
Youngers, Stephen A.; and Neufeld, Sidney B., 4,217,001, Cl. 299-82.000.
Neumann, Peter, to Sandoz Ltd. 2-Imidazolinylamino-2,1,3-benzothiadiazoles. 4,217,356, Cl. 424-270.000.
Neuner, Otto: *See*—
Dorlars, Alfons; and Neuner, Otto, 4,217,449, Cl. 542-462.000.
Newbert, Richard B. Releasably securable door knob tag. 4,216,598, Cl. 40-331.000.
Newkirk, David D.; and Login, Robert B., to BASF Wyandotte Corporation. Fiber lubricants derived from the oxyalkylation of a glycerol-1,3-dialkylether. 4,217,390, Cl. 428-395.000.
Newkirk, David D.; Login, Robert B.; and Thir, Basil, to BASF Wyandotte Corporation. Metal molds coated with oxidative stable polyoxyalkylene release agents. 4,217,394, Cl. 428-457.000.
NGK Spark Plug Co. Ltd.: *See*—
Ito, Tsuneo, 4,217,138, Cl. 75-170.000.
Nicholls, Oswald C. J. Tethered ball tennis practice apparatus. 4,216,960, Cl. 273-29.00A.
Nicholson, John M.: *See*—
Ezis, Andre; and Nicholson, John M., 4,217,320, Cl. 264-65.000.
Nicosia, Joseph M., Jr.: *See*—
Hiller, Edwin R.; Kaplan, Philip D.; Nicosia, Joseph M., Jr.; and Zuerndorfer, Henry D., 4,217,583, Cl. 343-7.700.
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, to Carl Hurth Maschinen- und Zahnradfabrik. Lift control device for propeller drive systems on watercrafts. 4,216,737, Cl. 440-61.000.
Niehaves, Kurt: *See*—
Schneider, Wolfgang; Von Praun, Ferdinand; and Niehaves, Kurt, 4,217,106, Cl. 8-127.000.
Nihon Denki Keiki Kenteisho: *See*—
Kusui, Shoji; Yamazaki, Nobuyasu; and Ikeda, Yoshio, 4,217,545, Cl. 324-107.000.

Niigata, Kunihiro: *See*—
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,217,305, Cl. 260-556.0AR.

Nikolaiski, Eckhard, to Fotobio Holding AG. 5-Oxy-substituted derivatives of Psoralene useful in dermatology. 4,217,445, Cl. 536-4.000.

Niles, Arthur B. Weight lifter safety chain. 4,216,959, Cl. 272-123.000.

Nilsson, Lennart: *See*—
Ljungberg, Per-Allan; and Nilsson, Lennart, 4,217,085, Cl. 425-335.000.

Nilsson, LGunnar: *See*—
Arlers, Sven; and Nilsson, LGunnar, 4,216,771, Cl. 128-218.00P.

Nink, Reinhard, to Bayer Aktiengesellschaft. Process for the production of lithium fluoride detectors. 4,217,166, Cl. 156-605.000.

Ninomiya, Kunihiro: *See*—
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, 4,217,366, Cl. 424-330.000.

Nippon Crucible Co., Ltd.: *See*—
Sasaki, Tadao; Komaru, Isamu; and Yoshioka, Ryuzo, 4,217,335, Cl. 423-345.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iwamatsu, Masayuki, 4,217,555, Cl. 330-267.000.

Nippon Kogaku K.K.: *See*—
Takenaka, Hiroshi, 4,217,025, Cl. 350-33.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.

Nippon Sanso K. K.: *See*—
Sakurai, Sumio; and Hirano, Takashi, 4,216,908, Cl. 239-132.300.

Nippon Soken, Inc.: *See*—
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,216,653, Cl. 60-276.000.
Noguchi, Masaaki; Tanaka, Yukiyasu; Tanaka, Taro; and Uejima, Norikatsu, 4,216,747, Cl. 123-51.0BA.

Nippon Telegraph & Telephone Public Corporation: *See*—
Kobayashi, Kazuo; Yuki, Kiyohiro; and Suzuki, Yutaka, 4,217,467, Cl. 178-67.100.

Nippondenso Co., Ltd: *See*—
Kobayashi, Akio, 4,216,750, Cl. 123-435.000.

Nishikawa, Teruhide: *See*—
Harao, Norio; Tokizawa, Hiroki; and Nishikawa, Teruhide, 4,217,518, Cl. 313-398.000.

Nishino, Atsushi; and Yoshida, Akihiko, to Matsushita Electric Industrial Co., Ltd. Humidity sensor of capacitance change type. 4,217,623, Cl. 361-286.000.

Nissan Motor Company, Limited: *See*—
Endo, Hiroshi; and Adachi, Masahiro, 4,217,582, Cl. 343-7.0VM.
Fujii, Masayuki, 4,216,977, Cl. 280-707.000.
Izumi, Masao, 4,216,822, Cl. 165-42.000.
Kato, Yoshiaki; and Yamaguchi, Hirotsugu, 4,217,644, Cl. 364-442.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Yoshino, Youziro; and Kondo, Kazuko, 4,217,285, Cl. 260-345.500.

NL Industries, Inc.: *See*—
Friedrich, Heinz G.; and Kennedy, James V., 4,217,295, Cl. 260-449.60M.

Nobbe, Volker: *See*—
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, 4,217,479, Cl. 219-121.00P.

Noble, Billy M. Side hill bed shaper and planter. 4,216,730, Cl. 111-69.000.

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Dufford, Max H., Jr.; and Price, Earl T., 4,217,491, Cl. 250-223.00R.

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Gelsing, Winfried; and Nolzen, Hans-Martin, 4,217,097, Cl. 432-234.000.

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Carnavos, Theodore C.; and Golymbieski, Walter J., 4,216,575, Cl. 29-597.000.

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Norris, Elwood G. Switching unit for selectively connecting together various combinations of audio subsystems. 4,217,573, Cl. 340-147.00R.

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Sawyer, Robert E., Jr.; and Donahue, Robert J., 4,217,506, Cl. 307-360.000.

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Livermore, Frederick C.; and Boynton, Robert J., 4,217,480, Cl. 219-216.000.

Notaro, Frank, to Union Carbide Corporation. Enhanced condensation heat transfer device and method. 4,216,819, Cl. 165-1.000.

November, Milton H., to International Telephone and Telegraph Corporation. Fluid property detection system. 4,216,673, Cl. 73-861.000.

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Stoltze, Leon; Nutter, Harry A., Jr.; and Wilson, Robert F., 4,217,157, Cl. 156-87.000.

N.V. Klippan S.A.: *See*—
Weman, Per O., 4,216,922, Cl. 242-107.000.

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Glueckert, Albert J.; Honegger, Robert J.; Nylund, Everett E.; and Saigh, Philip A., 4,216,554, Cl. 4-323.000.

O'Boyle, Matthew; Schneider, Alan A.; and Magladry, Ross E., to Catalyst Research Corporation. Lithium halide battery. 4,217,403, Cl. 429-162.000.

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Ogawa, Mutsuo, to Ricoh Company, Ltd. Optoelectronic scanning apparatus. 4,217,611, Cl. 358-294.000.

Ogita, Tamotsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control device. 4,216,749, Cl. 123-408.000.

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Iinuma, Kazuhiro; Takamizawa, Kinya; and Ogura, Ichiro, 4,217,516, Cl. 310-335.000.

O'Hanlon, Dudley J., to Winfield Agri-Builders Company. Material spreader. 4,216,914, Cl. 239-666.000.

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Watanabe, Masaru; Yoyama, Tadao; and Ohashi, Azusa, 4,217,407, Cl. 430-166.000.

Ohashi, Yasuo: *See*—
Nagata, Kunio; and Ohashi, Yasuo, 4,216,675, Cl. 73-362.0AR.

Ohdan, Kyoji: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; Bando, Yasuo; and Hisayuki, Terumi, 4,217,309, Cl. 568-477.000.

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Ohtuka, Tadao; Ohe, Takeshi; and Hamano, Kunihiro, 4,216,841, Cl. 180-141.000.

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Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,217,432, Cl. 526-119.000.

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Inada, Masami; Ohumi, Takeharu; and Tsunekawa, Masaru, 4,216,938, Cl. 251-65.000.

Oka, Hirokazu, to Silver Seiko Ltd. Type action for a power-driven typewriter. 4,217,056, Cl. 400-368.000.

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Hamano, Eizaburo; Okada, Hisafumi; and Yamazaki, Hidetoshi, 4,217,566, Cl. 335-212.000.

Okada, Hisao: *See*—
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Okamura, Masayuki: *See*—
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, 4,216,753, Cl. 123-445.000.

Okita, Tetsuo: *See*—
Kono, Hisashi; Nakai, Shigeyuki; Hisadomi, Masaki; Minemura, Norimichi; Okita, Tetsuo; and Kawamura, Sigeru, 4,217,127, Cl. 71-28.000.

Okutsu, Masaru: *See*—
Yasuda, Naohiko; Eguchi, Chikahiko; Okutsu, Masaru; and Hirose, Yoshiteru, 4,217,450, Cl. 544-25.000.

Okuyama, Yasuhiko; Tanaka, Koji; Nakayama, Yoshiro; and Kato, Hiroshi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Keyboard type automatic accompanying system. 4,216,692, Cl. 84-1.010.

Oldham, Ronald C., to International Standard Electric Corporation. Cable anchor. 4,217,464, Cl. 174-79.000.

Oliff, James R., to Mead Corporation, The. Tubular carton. 4,216,861, Cl. 206-427.000.

Olin Corporation: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,217,198, Cl. 204-252.000.

Olivie, Jacques, to Akzona Incorporated. Synthesis for the preparation of tetracyclic compounds. 4,217,452, Cl. 544-246.000.

Olmstead, Edward A., to Black Bocs, Ltd. Computer performance measurement device and process. 4,217,636, Cl. 364-200.000.

Olsen, John H.; Hurlburt, George H.; and Kapcsandy, Louis E., to Flow Research, Inc. Method of making high velocity liquid jet. 4,216,906, Cl. 239-11.000.

Olsen, Robert C.; and Edwards, Bryant, to Illinois Tool Works, Inc. Planting system including articles of manufacture. 4,216,621, Cl. 47-73.000.

Olson, Byron W.: *See*—
Baker, Ralph N., III; Bond, James D.; and Olson, Byron W., 4,216,658, Cl. 62-99.000.

Olympia Werke AG: *See—*
Achenbach, Karlheinz, 4,216,740, Cl. 118-681.000.
Olympic Fishing Tackles Company, Limited: *See—*
Takeuchi, Hiroshi, 4,216,603, Cl. 43-22.000.
Omron Tateisi Electronics Co.: *See—*
Nagata, Kunio; and Ohashi, Yasuo, 4,216,675, Cl. 73-362.0AR.
Ondetti, Miguel A.; and Condon, Michael E., to E. R. Squibb & Sons, Inc. Acylmercaptoacyl derivatives of 4,5-dihydro-1H-pyrrole-2-carboxylic acids and 1,4,5,6-tetrahydropyridine-2-carboxylic acids. 4,217,458, Cl. 546-326.000.
Onisko, Bruce L.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; and Onisko, Bruce L., 4,217,288, Cl. 260-397.200.
Ono, Takezo, to Teijin Ltd. Method for storing developers. 4,217,188, Cl. 204-109.000.
Ono, Yukiharu: *See—*
Sato, Yasuhisa; Tajima, Akira; and Ono, Yukiharu, 4,217,050, Cl. 354-225.000.
Onori, Vito M.: *See—*
Tashman, Philip; and Onori, Vito M., 4,216,845, Cl. 186-49.000.
Oppelt, John C.: *See—*
Hoffman, Joseph A.; Savides, Christos; and Oppelt, John C., 4,217,267, Cl. 260-45.75D.
Ordines, Jean-Pierre, to Societe pour l'Equipement de Vehicules. High tension distributing device. 4,216,755, Cl. 123-643.000.
Ormerod, Alan, to Lucas Industries Limited. Sealing arrangement for use in a combustion assembly. 4,216,651, Cl. 60-740.000.
Oronzio de Nora Impianti Elettrochimici S.p.A.: *See—*
Pellegri, Alberto; and Spaziante, Placido M., 4,217,401, Cl. 429-39.000.
Ortiz, Nilson V. Toy gun. 4,216,609, Cl. 46-38.000.
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Oschatz GmbH: *See—*
Gelsing, Winfried; and Nolzen, Hans-Martin, 4,217,097, Cl. 432-234.000.
Oshin, Leonid A.: *See—*
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.
Ostermayer, Franz: *See—*
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,217,350, Cl. 424-250.000.
Oswald, Roger; and Agache, Georges, to Agence Nationale de Valorisation de la Recherche (ANVAR). Engine whose fuel is a product other than a petroleum product. 4,216,744, Cl. 123-1.00A.
Otis Engineering Corporation: *See—*
Fredd, John V., 4,216,830, Cl. 166-319.000.
O'Toole, Jerome: *See—*
Wright, David M.; O'Toole, Jerome; and Hedstrom, Norman A., 4,217,008, Cl. 312-184.000.
Otsuka, Kazuo: *See—*
Matsushita, Takeshi; Ida, Jinsei; and Otsuka, Kazuo, 4,216,572, Cl. 29-568.000.
Otsuka Pharmaceutical Co., Ltd.: *See—*
Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, 4,217,345, Cl. 424-180.000.
Otsuka, Shoichi; and Fukui, Takashi, to Horikiri Spring Manufacturing Co., Ltd. Method of forming a taper leaf. 4,216,667, Cl. 72-366.000.
Outboard Marine Corporation: *See—*
Mura, Richard J., 4,216,756, Cl. 123-597.000.
Ovshinsky, Stanford R.; and Izu, Masatsugu, to Energy Conversion Devices, Inc. Amorphous semiconductors equivalent to crystalline semiconductors. 4,217,374, Cl. 427-39.000.
Owen, Robert D.: *See—*
Dalley, Robert J.; and Owen, Robert D., 4,217,634, Cl. 363-89.000.
Owens-Illinois, Inc.: *See—*
Michalski, Thomas F., 4,217,655, Cl. 364-701.000.
Oyama, Shigeaki: *See—*
Kohzai, Yoshinori; and Oyama, Shigeaki, 4,217,513, Cl. 310-186.000.
Palmer, Reginald J. Dry cleaning processes. 4,217,115, Cl. 55-95.000.
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., to American Cyanamid Company. Process for flocculation using crosslinked polysulfonium compounds. 4,217,215, Cl. 210-54.000.
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Panzer, Hans P.: *See—*
Coscia, Anthony T.; Panzer, Hans P.; and O'Connor Michael N. D., 4,217,262, Cl. 260-29.6SQ.
Paraskos, John A.; and Smith, Edward W., to Gulf Research & Development Company. Process for selective recovery of relatively metals-free bitumen from tar sand using a halogenated aliphatic solvent in combination with a second solvent. 4,217,202, Cl. 208-11.0LE.
Parker, Kenneth R.: *See—*
Wyatt, John G.; and Parker, Kenneth R., 4,216,708, Cl. 98-36.000.
Parkinson, Wayne K., to W. H. Brady Co. Connecting flexible switch. 4,217,473, Cl. 200-159.00B.
Parro, James J.: *See—*
Caltagirone, Anthony V.; Bradford, George J.; and Parro, James J., 4,217,646, Cl. 364-493.000.
Partridge, Jerry A.: *See—*
Lerch, Ronald E.; and Partridge, Jerry A., 4,217,192, Cl. 204-149.000.
Paschenko, Larisa E.: *See—*
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.
Pashin, Jury M.: *See—*
Dmitrievsky, Anatoly V.; Kamenev, Vladimir F.; Pashin, Jury M.; Prudov, Nikolai M.; Simatov, Alexandr I.; Tjufyakov, Andrei S.; Shishkin, Jury N.; and Yamolov, Jury I., 4,217,313, Cl. 261-41.00D.
Pasqualucci, Carmine: *See—*
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,276, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,277, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, 4,217,278, Cl. 260-239.30P.
Pasquarello, Edward J. Shampoo apparatus. 4,216,551, Cl. 4-521.000.
Passafiume, Anthony; Lamber, Clarence F.; and Dickover, William, to Johnson & Johnson. Method for shaping and/or cutting batts of loosely compacted fibrous materials. 4,216,687, Cl. 83-26.000.
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Volgstadt, Frank R.; Reschke, Albert H.; Passerell, David P.; and Day, Raymond A., 4,216,793, Cl. 137-318.000.
Patent-Treuhand-Gesellschaft fur Elektrische Gluampen mbH: *See—*
Albrecht, Wolfgang, 4,217,630, Cl. 362-217.000.
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., to Textile Rubber & Chemical Company, Inc.; and Exxon Research & Engineering Co. Foam coated carpet primary backing material. 4,217,383, Cl. 428-95.000.
Paul Wurth S.A.: *See—*
Sieweke, Wilhelm; Nettler, Hubert; and Burmann, Jurgen, 4,216,946, Cl. 266-87.000.
Paule, Kurt; and Vogel, Eberhard, to Robert Bosch GmbH. Hedge trimmer. 4,216,582, Cl. 30-216.000.
Peerman, Dwight E.; and Kanten, H. Gordon, to Henkel Corporation. Polyamide adhesive for bonding fabrics. 4,217,256, Cl. 260-18.00N.
Pekh, Anatoly K.: *See—*
Kosyrev, Felix K.; Timofeev, Valery A.; Pekh, Anatoly K.; and Leonov, Alexandr P., 4,217,560, Cl. 331-94.50D.
Pelcher, Anthony M.: *See—*
Gould, John S.; Winquist, Roger D.; Eve, William R., IV; McCutchen, James V.; Pelcher, Anthony M.; and Watson, Richard E., 4,216,839, Cl. 180-65.00R.
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Pelosi, Stanford S., Jr.; White, Ronald E.; Wright, George C.; and Yu, Chia N., to Morton-Norwich Products, Inc. 5-Phenyl-2-furancarboximidamides. 4,217,286, Cl. 260-347.700.
Penick, Walter J.: *See—*
Rod, Robert L.; Penick, Walter J.; and Dobson, Rodney J., 4,217,402, Cl. 429-111.000.
Pennington, Clifford. Air venting system for automotive vehicles. 4,216,707, Cl. 98-2.000.
Pennwalt Corporation: *See—*
Dyball, Christopher J., 4,217,433, Cl. 525-277.000.
PepsiCo, Inc.: *See—*
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Perfection Corporation: *See—*
Volgstadt, Frank R.; Reschke, Albert H.; Passerell, David P.; and Day, Raymond A., 4,216,793, Cl. 137-318.000.
Perkert, Rudolf: *See—*
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Perregaux, Alain, to BBC Brown, Boveri & Company, Limited. Thin polarizer for an electro-optically activated cell and method for making same. 4,217,160, Cl. 156-239.000.
Petaja, Glen E.: *See—*
Braun, Richard R.; Petaja, Glen E.; and Cedar, Charles E., 4,216,824, Cl. 165-69.000.
Peters, Thomas E.: *See—*
Kim, Han J.; Peters, Thomas E.; and Snee, David, 4,217,139, Cl. 75-206.000.
Peterson, Brian P.: *See—*
Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., 4,217,327, Cl. 264-293.000.
Peterson, Marvin A., to General Electric Company. Curable mixture of water soluble polyester and polyimide precursor, process of coating and products. 4,217,389, Cl. 428-383.000.
Peterson, Wesley R.: *See—*
Jaffe, Wolfgang; and Peterson, Wesley R., 4,217,507, Cl. 310-12.000.
Petit, Andre; and Jamet, Daniel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Device for connecting racks to distribution frames in telecommunications exchanges. 4,217,023, Cl. 339-121.000.
Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,217,329, Cl. 422-12.000.

Petroll, Hans-Werner: *See—*
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.

Petty, Herbert E., to Union Carbide Corporation. Method for producing mercaptan-containing organosilicon compounds. 4,217,294, Cl. 556-419.000.

Pfister, Jurg R., to Syntex (U.S.A.) Inc. Disubstituted xanthone-2-carboxylic acid antiallergy agents. 4,217,361, Cl. 424-283.000.

Pfizer Inc.: *See—*
Cross, Peter E.; and Dickinson, Roger P., 4,217,357, Cl. 424-273.00R.
Daumy, Gaston O., 4,217,416, Cl. 435-146.000.
Harbert, Charles A.; and Lombardino, Joseph G., 4,217,355, Cl. 424-270.000.
Moore, James W., 4,217,446, Cl. 536-10.000.

Pfleger, Klaus: *See—*
Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, 4,217,431, Cl. 526-68.000.

Phillips, Kenneth G.: *See—*
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Phillips Petroleum Company: *See—*
Bresson, Clarence R., 4,217,259, Cl. 260-28.5AS.
Christie, David A., 4,217,243, Cl. 252-419.000.
Drake, Charles A., 4,217,303, Cl. 260-465.80R.
Montgomery, Dean P., 4,217,244, Cl. 252-419.000.
Murtha, Timothy P., 4,217,248, Cl. 252-455.00Z.

Piascinski, Joseph J., to RCA Corporation. Method for assembling a base to an electron tube. 4,217,014, Cl. 316-17.000.

Piazza, Michael C., Jr.: *See—*
Weinstein, Marc D.; and Piazza, Michael C., Jr., 4,217,046, Cl. 354-76.000.

Picchione, P. Vincent. Injury protection device for athletes. 4,216,547, Cl. 2-22.000.

Picker Corp.: *See—*
Gacki, Leonard W.; and Daly, Robert E., 4,217,054, Cl. 366-150.000.

Pickering, John R., to Datron Electronics Limited. Electrical measurements. 4,217,651, Cl. 364-571.000.

Pickett Hosiery Mills, Inc.: *See—*
Harris, J. Nimrod, Jr.; and Howell, Willie M., 4,216,662, Cl. 66-186.000.

Picunko, Thomas: *See—*
Dam, Naim G.; Picunko, Thomas; and Kramer, Henry H., 4,217,642, Cl. 364-416.000.

Pifer, Robert T. A. Cigarette tray. 4,216,873, Cl. 220-4.00R.

Pilkington Brothers Limited: *See—*
Dickinson, George A., 4,217,125, Cl. 65-99.00A.

Pillsbury Company, The: *See—*
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Pinsky, Grigory B.: *See—*
Detinko, Felix M.; Dukshtau, Alexandr A.; and Pinsky, Grigory B., 4,217,510, Cl. 310-51.000.

Pioneer Electronic Corporation: *See—*
Ito, Hideo; and Kawanabe, Yoshihiro, 4,217,556, Cl. 330-268.000.
Suzuki, Tsutomu, 4,217,615, Cl. 360-137.000.

Pischtschan, Alfred; Wolf, Karlheinz; Hornle, Reinhold; Bremer, Fritz; Arnold, Bernhard; and Kullick, Werner, to Bayer Aktiengesellschaft. Pigment preparations. 4,217,266, Cl. 260-42.210.

Pitts, Charlie C. Stabilizer for dumping vehicles. 4,216,996, Cl. 298-17.00S.

Pixley, James J., to Uniroyal, Inc. Pneumatic tire having a run-flat insert structure. 4,216,809, Cl. 152-158.000.

Pizur, Stephen J., Sr. Method of producing a decorative effect on planar surfaces and articles produced thereby. 4,217,378, Cl. 427-259.000.

Planker, Siegfried; Baessler, Konrad; and Fuchs, Otto, to Hoechst Aktiengesellschaft. Process for the preparation of 2,2'-dichlorohydrazobenzene. 4,217,307, Cl. 260-569.000.

Plastics, Inc.: *See—*
Cunningham, Emmett M., 4,216,727, Cl. 108-20.000.

Pletts, Donald C. Fuel component extractor. 4,216,654, Cl. 60-311.000.

Plymouth Locomotive Works, Inc.: *See—*
Christian, Miles W., 4,217,086, Cl. 425-376.00R.

Poduje, Noel S.: *See—*
Abbe, Robert C.; and Poduje, Noel S., 4,217,542, Cl. 324-57.00R.

Poff, James L., to Bryant-Poff, Inc. Grain retarder. 4,216,853, Cl. 193-32.000.

Polaroid Corporation: *See—*
Benton, Stephen A., 4,217,405, Cl. 430-2.000.

Polinsky, Michael V.: *See—*
Zellner, John R.; Lehto, Eino M.; and Polinsky, Michael V., 4,217,039, Cl. 353-27.00R.

Politechnika Warszawska: *See—*
Sandowicz, Michal; Wiaderek, Krzysztof; and Hamann, Waldemar, 4,217,080, Cl. 425-95.000.

Polozov, Oleg V.: *See—*
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.

Polychrome Corporation: *See—*
Mukai, Cromwell D., 4,217,242, Cl. 252-389.00A.

Pompon, Jean-Bernard; and Soussan, Salomon, to Rhone-Poulenc Industries. Method of degassing polymers prepared by mass polymerizing a monomeric composition based on vinyl chloride. 4,217,444, Cl. 528-499.000.

Pope, George F.; and Childress, Evelyn O., to Diversified Manufacturing & Marketing Co., Inc. Versatile standoff insulator and charged fence array for mounting on chain link fences and elsewhere. 4,216,943, Cl. 256-10.000.

Popp, Gerhard; and Held, Gerhard, to BBC Brown, Boveri & Company, Limited. Method for control of an open gallium diffusion. 4,217,154, Cl. 148-189.000.

Porawski, Donald J.: *See—*
Tawfik, David A.; Doniger, Jerry; and Porawski, Donald J., 4,217,486, Cl. 371-68.000.

Porta, Augusto: *See—*
Doniat, Denis; Corajoud, Jean-Michel; Mosetti, Jacques; and Porta, Augusto, 4,217,191, Cl. 204-130.000.

Porter, Marion G.; Ryan, Charles P.; and Shelly, William A., to Honeywell Information Systems Inc. Cache unit with transit block buffer apparatus. 4,217,640, Cl. 364-200.000.

Post Office, The: *See—*
Rollett, John M.; and Greaves, Alan J., 4,217,562, Cl. 333-28.00R.

Postolov, Petr M.: *See—*
Akopov, Ernest M.; and Postolov, Petr M., 4,216,890, Cl. 227-22.000.

Potter Instrument Company, Inc.: *See—*
Mosciatti, Roger; Foley, Thomas P.; and Moritz, Frederick G., 4,216,889, Cl. 226-118.000.

Poulton, Geoffrey T.: *See—*
Wild, John P.; and Poulton, Geoffrey T., 4,217,590, Cl. 343-754.000.

PPG Industries, Inc.: *See—*
Cormany, Charles L., 4,217,310, Cl. 260-652.50R.
Cunningham, Hugh, 4,217,199, Cl. 204-256.000.

President and Fellows of Harvard College: *See—*
Tolbert, William R.; Feder, Joseph; Kuo, Mau-Jung; and Folkman, Moses J., 4,217,412, Cl. 435-68.000.

Pressure Technology, Inc.: *See—*
Bowles, Arnold G., 4,217,087, Cl. 425-78.000.

Price, Earl T.: *See—*
Dufford, Max H., Jr.; and Price, Earl T., 4,217,491, Cl. 250-223.00R.

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Joshi, Madhukar L.; Mason, Richard K.; and Pricer, Wilbur D., 4,216,573, Cl. 29-571.000.

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Buell, Kenneth B., 4,217,078, Cl. 425-81.100.
Goodman, John F., 4,217,105, Cl. 8-111.000.

Prokopenko, Leonid I.: *See—*
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Starp, Franz, 4,216,626, Cl. 51-58.000.

Propst, Robert L., to Herman Miller, Inc. Material handling system. 4,217,073, Cl. 414-421.000.

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Psyras, Louis G. Aerodynamic toy. 4,216,611, Cl. 46-74.00D.

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Puck, Alfred, to Ciba-Geigy Corporation. Method of forming prestressed filament wound pipe. 4,217,158, Cl. 156-156.000.

Pullman Incorporated: *See—*
Hallam, Keith J., 4,216,725, Cl. 105-348.000.

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Hillberry, Benny M.; and Kettelkamp, Donald B., 4,216,549, Cl. 3-1.911.

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Sudler, Roland, 4,217,509, Cl. 310-49.00R.

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Strahs, Martin P., 4,216,562, Cl. 15-119.00A.

Quinlan, Patrick M., to Petrolite Corporation. Sulfone containing quaternary ammonium derivatives of 1,4-thiazines. 4,217,329, Cl. 422-12.000.
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Qume Corporation: *See*—
Moon, S. David, 4,217,055, Cl. 400-144.200.
R & D Associates: *See*—
Latter, Albert L.; Hammond, R. Philip; and Dooley, James L., 4,216,745, Cl. 123-26.000.
Ridgway, Stuart L., 4,216,657, Cl. 60-641.000.
R. D. Werner Co., Inc.: *See*—
Kocina, Lawrence A.; and Roche, John N., 4,216,597, Cl. 40-156.000.
R. J. Stoltz Enterprises Inc.: *See*—
Stoltz, Richard J., 4,216,790, Cl. 137-357.000.
R. W. Hartnett Company: *See*—
Ackley, Charles E., Sr.; and Ackley, Charles E., Jr., 4,216,714, Cl. 101-40.000.
Racz, Janos A.; and Seppi, Edward J., to General Electric Company. Tomographic scanning apparatus with ionization detector means. 4,217,498, Cl. 250-385.000.
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Radek, John R., to Ready Metal Manufacturing Company. Document storage devices for service truck. 4,216,728, Cl. 108-44.000.
Radovich, Danilo, to United States of America, Air Force. Elliptic cylindrical baffle assembly. 4,217,026, Cl. 350-58.000.
Rahrig, Donald D.: *See*—
Hagedorn, Floyd T.; Rahrig, Donald D.; Revells, Robert G.; and Bushong, James A., 4,217,126, Cl. 65-106.000.
Rain Bird Sprinkler Mfg. Corp.: *See*—
Troup, Edward M., 4,216,913, Cl. 239-594.000.
Ralston Purina Company: *See*—
Hawley, Robert L., 4,217,367, Cl. 426-2.000.
Ramsey, Vernon B.; and Wilkes, Thomas J., to Teledyne Industries, Inc. Solenoid dashpot pedal actuator assemblies. 4,216,694, Cl. 84-23.000.
Raphael Katzen Associates International, Inc.: *See*—
Katzen, Raphael; Moon, George D., Jr.; and Kumana, Jimmy D., 4,217,178, Cl. 203-19.000.
Raskin S.A.: *See*—
Fossard, Marcel, 4,217,068, Cl. 414-20.000.
Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., 4,217,453, Cl. 544-373.000.
Ratliff, Roger D., to PepsiCo, Inc. Hollow panel structure and method for the construction thereof. 4,216,635, Cl. 52-481.000.
Raudat, John L., to Standard-Knapp, Inc. Line brake assembly for case packer. 4,216,855, Cl. 198-633.000.
Rauterberg, Jochen: *See*—
Straszewski, Klaus; Rauterberg, Jochen; and Zuchner, Werner, 4,217,058, Cl. 401-135.000.
Rawles, William T.; and Jenkins, Kenneth. Rotary furnace for the fusion of mineral bearing substances, apparatus and method. 4,217,462, Cl. 13-10.000.
Rawlings, Robert M.; and Procter, Donald, to Blue Wing Corporation. Lipid-containing feed supplements and foodstuffs. 4,217,370, Cl. 426-98.000.
Rayborn, Jerry J. Process and system for recovering solid particulate additives from a drilling fluid. 4,216,836, Cl. 175-66.000.
Raygo Wagner, Inc.: *See*—
Robnett, James J.; and Herold, William H., 4,217,076, Cl. 414-735.000.
Raytheon Company: *See*—
Feist, Wolfgang M., 4,216,574, Cl. 29-578.000.
Hiller, Edwin R.; Kaplan, Philip D.; Nicosia, Joseph M., Jr.; and Zuerndorfer, Henry D., 4,217,583, Cl. 343-7.700.
Lowenschuss, Oscar, 4,217,580, Cl. 343-5.0DP.
RCA Corporation: *See*—
Allen, James A., 4,216,969, Cl. 274-9.00B.
Carlson, David E., 4,217,148, Cl. 136-89.0SJ.
Catanese, Carmen A.; and Cosentino, Louis S., 4,217,519, Cl. 313-411.000.
Piasecinski, Joseph J., 4,217,014, Cl. 316-17.000.
Schwartz, Herbert M., 4,217,613, Cl. 360-119.000.
Staebler, David L.; and Zanzucchi, Peter J., 4,217,393, Cl. 428-450.000.
Wang, Chih C.; Ekstrom, Lincoln; and Wielicki, Henry, 4,216,970, Cl. 274-42.00R.
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Weiss, Robert L., 4,216,988, Cl. 296-43.000.
Ready Metal Manufacturing Company: *See*—
Radek, John R., 4,216,728, Cl. 108-44.000.
Rebsamen, Ernst: *See*—
Kampeen, Yves; Hoppe, Bernd; and Rebsamen, Ernst, 4,217,226, Cl. 210-376.000.
Reed, Brian J.: *See*—
King, Edward I., Jr.; and Reed, Brian J., 4,217,511, Cl. 310-55.000.
Reed, Robert D., to John Zink Company. Burner for very low pressure gases. 4,217,088, Cl. 431-181.000.
Regie Nationale des Usines Renault: *See*—
Decouzon, Georges, 4,216,842, Cl. 180-146.000.
Reh, Oswald R.; and Heinzer, Hans E., to International Telephone and Telegraph Corporation. Fiber optic electromechanical submarine cable termination. 4,217,028, Cl. 350-96.200.
Reich, Harry; and Coney, Joseph J., to Coney, Joseph J. Process for plant scale production of cement with mechanical compounding. 4,217,143, Cl. 106-100.000.
Reider, Samuel B.: *See*—
Herman, Avrum S.; Reider, Samuel B.; and Sharpe, Cecil H., 4,216,652, Cl. 60-748.000.
Reilly, Bertram B. Apparatus for solid waste pyrolysis. 4,217,175, Cl. 202-118.000.
Reker, Frederick A.: *See*—
Toth, Maria; and Reker, Frederick A., 4,217,474, Cl. 200-335.000.
Renshaw, Robin: *See*—
Chang, Nuke M.; and Renshaw, Robin, 4,216,896, Cl. 228-212.000.
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Volgstadt, Frank R.; Reschke, Albert H.; Passerell, David P.; and Day, Raymond A., 4,216,793, Cl. 137-318.000.
Respiratory Care, Inc.: *See*—
Cambio, Orlando D., Jr., 4,217,328, Cl. 264-504.000.
Reuss, Mira: *See*—
Krisp, Werner; and Reuss, Mira, 4,217,234, Cl. 252-99.000.
Reuther, Richard. Tensioning device for a gymnastics apparatus. 4,216,958, Cl. 272-109.000.
Revells, Robert G.: *See*—
Hagedorn, Floyd T.; Rahrig, Donald D.; Revells, Robert G.; and Bushong, James A., 4,217,126, Cl. 65-106.000.
Reynolds International, Inc.: *See*—
Mack, Grant V., 4,216,632, Cl. 52-40.000.
Reynolds, James M., to Zulauf Inc. Orthodontic appliance. 4,216,583, Cl. 433-9.000.
Reynolds, Richard W., to Sundstrand Corporation. Air-oil separator for aircraft gearbox. 4,217,120, Cl. 55-385.00R.
Rhone-Poulenc Industries: *See*—
Daniel, Jean-Claude; and Jorio, Nadine, 4,217,260, Cl. 260-29.60H.
Pompon, Jean-Bernard; and Soussan, Salomon, 4,217,444, Cl. 528-499.000.
Ribich, Rodolfo J., deceased: *See*—
Trp, Peter; Lipovac, Mile; Ribich, Rodolfo J., deceased; and Ribich, Virginia, legal representative, 4,217,062, Cl. 401-44.000.
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Rice, Johnnie W.; Gripshover, Ronald J.; Rose, Millard F.; and Van Wagoner, Richard C., to United States of America, Navy. Spiral line oscillator. 4,217,468, Cl. 178-116.000.
Richards, William; and Grolman, Bernard, to American Optical Corporation. Marking pen holder. 4,216,588, Cl. 33-189.000.
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, to Upjohn Company, The. Polyurethane forming compositions. 4,217,436, Cl. 528-45.000.
Ricoh Company, Ltd.: *See*—
Horike, Masanori; Jinnai, Koichiro; Iwasaki, Kyuhachiro; and Kodama, Yutaka, 4,217,595, Cl. 346-75.000.
Ogawa, Mutsuo, 4,217,611, Cl. 358-294.000.
Tani, Tatsuo; and Kono, Masao, 4,217,052, Cl. 355-8.000.
Ridgway, Peter C.; and Case, Derek F., to Data Recording Instruments Limited. Magnetic core formed from laminations. 4,217,168, Cl. 430-320.000.
Ridgway, Stuart L., to R & D Associates. Mist flow ocean thermal energy process. 4,216,657, Cl. 60-641.000.
Rilbe, Harry, to Ingenjorsfirman Gradient Birgit Och Harry Rilbe. Method and apparatus for isoelectric focusing without use of carrier ampholytes. 4,217,193, Cl. 204-180.00G.
Ritchie, Arthur D.: *See*—
Sato, Shuichi; Yamaguchi, Tadanori; and Ritchie, Arthur D., 4,217,599, Cl. 357-23.000.
Ritchie, David A. Golf club attachment for raking sand traps and retrieving golf balls. 4,216,831, Cl. 172-380.000.
Rittenbach, Otto E.: *See*—
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Robert Bosch GmbH: *See*—
Hauler, Peter; Bremer, Wolfgang; Weiss, Karl-Ernst; and Heintz, Frieder, 4,217,512, Cl. 310-155.000.
Jung, Werner, 4,217,596, Cl. 346-135.100.
Kirner, Kuno, 4,217,470, Cl. 200-19.00R.
Kopse, Odon, 4,216,912, Cl. 239-533.400.
Lavanchy, Jean-Pierre; and Heizmann, Frieder, 4,217,053, Cl. 356-372.000.
Paule, Kurt; and Vogel, Eberhard, 4,216,582, Cl. 30-216.000.
Romann, Peter, 4,216,757, Cl. 123-179.00L.
Scheying, Hans; and Schleupen, Richard, 4,217,528, Cl. 318-293.000.
Roberts, George W.: *See*—
Hindin, Saul G.; and Roberts, George W., 4,217,332, Cl. 423-249.000.
Robin, Marcel, to Commissariat a l'Energie Atomique. Pump/heat exchanger. 4,216,821, Cl. 165-11.00R.
Robinson, Vivian N. E. Electron microscope backscattered electron detectors. 4,217,495, Cl. 250-310.000.
Robnett, James J.; and Herold, William H., to Raygo Wagner, Inc. Load handling vehicle with rotating grapple mechanism. 4,217,076, Cl. 414-735.000.

Robustelli, Albert G.: *See*—
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,215, Cl. 210-54.000.
Panzer, Hans P.; Coscia, Anthony T.; and Robustelli, Albert G., 4,217,443, Cl. 528-373.000.
Rocereta, William J. Car uncouplers for model train tracks. 4,216,871, Cl. 213-211.000.
Roche, John N.: *See*—
Kocina, Lawrence A.; and Roche, John N., 4,216,597, Cl. 40-156.000.
Rockwell-Golde, G.m.b.H.: *See*—
Blankenburg, Heinz; Schafer, Peter; and Herrmann, Friedrich, 4,216,624, Cl. 49-352.000.
Rockwell International Corporation: *See*—
Austerman, Stanley B., 4,217,167, Cl. 156-624.000.
Rosman, Irwin E., 4,216,881, Cl. 222-94.000.
Schoeneweis, E. Frederick, 4,216,703, Cl. 92-63.000.
Rod, Robert L.; Penick, Walter J.; and Dobson, Rodney J., to Monosolar Inc. Photoelectrochemical cells having gelled electrolyte. 4,217,402, Cl. 429-111.000.
Rodgers, Steven S., to T.E.S., Inc. Heat generator. 4,216,660, Cl. 62-238.000.
Roe, David; and Sowter, Brian R., to International Business Machines Corporation. Character graphics color display system. 4,217,577, Cl. 340-703.000.
Rogers Corporation: *See*—
Wright, Richard V.; and Carter, Robert E., 4,216,644, Cl. 57-58.890.
Rogers, Norman H.: *See*—
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,447, Cl. 542-426.000.
Luk, Kong; Clayton, John P.; and Rogers, Norman H., 4,217,448, Cl. 542-427.000.
Rohm and Haas Company: *See*—
Beasley, Glenn H., 4,217,421, Cl. 521-32.000.
Weese, Richard H.; and Yarnell, Thomas M., 4,217,424, Cl. 525-67.000.
Rohr Industries, Inc.: *See*—
Lawson, Dale W. R., 4,216,926, Cl. 244-110.00B.
Rollett, John M.; and Greaves, Alan J., to Post Office, The. Equalizer networks providing a bump shaped response. 4,217,562, Cl. 333-28.00R.
Rolls-Royce Limited: *See*—
Carlin, Robert N., 4,216,909, Cl. 239-265.310.
Romann, Peter, to Robert Bosch GmbH. Electrical control circuit, especially for a fuel supply device of an internal combustion engine. 4,216,757, Cl. 123-179.00L.
Rooney, John P., to USM Corporation. Shoe sole molds. 4,217,081, Cl. 425-129.00S.
Rosati, Alfonso A.: *See*—
Avritt, Michael D.; Lamos, Richard A.; and Rosati, Alfonso A., 4,216,955, Cl. 271-296.000.
Rose, Millard F.: *See*—
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Rosenthal Technik AG: *See*—
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Rosier, Jean-Claude, to U.S. Philips Corporation. Device for location-sensitive detection of photon and/or particle radiation. 4,217,489, Cl. 250-207.000.
Rosman, Irwin E., to Rockwell International Corporation. Propellant storage expulsion system. 4,216,881, Cl. 222-94.000.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to Archifar Laboratori Chimico Farmacologici S.p.A. Rifamycin compounds. 4,217,276, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to Archifar Laboratori Chimico Farmacologici S.p.A. Process for producing 3-amino-rifamycins S and SV. 4,217,277, Cl. 260-239.30P.
Rossetti, Vittorio; Marsili, Leonardo; and Pasqualucci, Carmine, to Archifar Laboratori Chimico Farmacologici S.p.A. 3-Nitro-rifamycins S and SV. 4,217,278, Cl. 260-239.30P.
Rossi, Anthony J.; Lundberg, Richard E.; Fancy, Thomas A.; Behringer, Donald F.; and Haven, John B., to General Electric Company. Turbine trip circuit. 4,217,617, Cl. 361-51.000.
Rossler, Frederick W., Jr.; and Anderson, Gerald M., to AMP Incorporated. Strain relief. 4,216,930, Cl. 248-56.000.
Rossman, Herman: *See*—
Weintraub, Morton; Waxman, Elliot; and Gendelman, Bernard, 4,217,541, Cl. 323-51.000.
Rott, Hans: *See*—
Koerner, Gotz; and Rott, Hans, 4,217,228, Cl. 252-8.600.
Roy, Kenneth L.; and Sadgebury, William D., to Ledex, Inc. Tubular solenoid. 4,217,567, Cl. 335-255.000.
Royce, Eric. Claw hammer. 4,216,808, Cl. 145-29.00R.
Rubel, Paul; and Arnaud, Pierre, to Institut National de la Sante et de la Recherche Medicale. Apparatus for the acquisition and pre-processing of electrocardiographic data. 4,216,780, Cl. 128-699.000.
Rubin, Bernard: *See*—
Horovitz, Zola P.; and Rubin, Bernard, 4,217,347, Cl. 424-246.000.
Rueff, John R.: *See*—
Downie, David E.; Harvey, Robert J.; and Rueff, John R., 4,216,776, Cl. 128-305.000.
Russell, James P. Corner lighting assembly. 4,217,629, Cl. 362-147.000.
Russell, Robert E., to Molten Steel Products, Inc. Compositions and methods for desulphurizing molten ferrous metals. 4,217,134, Cl. 75-58.000.
Rustad, Stanley C.: *See*—
Haub, John T.; Krassas, James G.; Rustad, Stanley C.; and Davis, Noel, 4,216,618, Cl. 47-65.000.
Ruzin, Leonid M.: *See*—
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Ryan, A. Sensor, to Weyerhaeuser Company. Disposable diaper with center folded edges. 4,216,773, Cl. 128-284.000.
Ryan, Charles P.: *See*—
Porter, Marion G.; Ryan, Charles P.; and Shelly, William A., 4,217,640, Cl. 364-200.000.
Ryan, Douglas G., to Exxon Research & Engineering Co. Continuous autorefrigerative dewaxing process and apparatus. 4,217,203, Cl. 208-35.000.
Rye, Grover W.: *See*—
Kersker, Theodore M.; and Rye, Grover W., 4,216,813, Cl. 152-361.0DM.
Ryer, Richard N., II, to Singer Company, The. Paper clamping device for sanding machine. 4,216,631, Cl. 51-170.0MT.
Sacher, Christoph: *See*—
Niederste-Hollenberg, Heinz; Sacher, Christoph; Fickenscher, Friedrich; and Eichinger, Johann, 4,216,737, Cl. 440-61.000.
Sackschewsky, William A. Automatic transmission. 4,216,683, Cl. 74-688.000.
Sadgebury, William D.: *See*—
Roy, Kenneth L.; and Sadgebury, William D., 4,217,567, Cl. 335-255.000.
Sahasrabudhe, Arun P.: *See*—
Anderson, Larry W.; and Sahasrabudhe, Arun P., 4,217,643, Cl. 364-426.000.
Saigh, Philip A.: *See*—
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Saito, Tadao: *See*—
Tasaki, Takaharu; Iizuka, Shigeo; and Saito, Tadao, 4,216,883, Cl. 222-321.000.
Saito, Yukio; Sekiya, Koichi; and Takahashi, Masaaki, to Sankyo Company Ltd. Method of measuring blood clotting time. 4,217,107, Cl. 23-230.00B.
Saito, Yukio: *See*—
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Sakai, Atsushi; Yamaguchi, Fumiaki; Kawazoe, Tetsu; Yonemori, Hayato; and Machida, Yoshio, to Mitsui Engineering and Shipbuilding Co., Ltd.; and Mitsui Petrochemical Industries Ltd. Process for cracking hydrocarbons utilizing a mist of molten salt in the reaction zone. 4,217,204, Cl. 208-125.000.
Sakai, Hitoshi: *See*—
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Sakamoto, Yohei: *See*—
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Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
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Ikegami, Kouzaburo; Morio, Yasumasa; and Sakai, Hitoshi, 4,217,060, Cl. 401-265.000.
Sakurai, Sumio; and Hirano, Takashi, to Nippon Sanso K. K. Burner for liquid fuel. 4,216,908, Cl. 239-132.300.
Salvador, Silvano E. Method for creating a simulated brick surface or the like. 4,217,379, Cl. 427-272.000.
Salzberg, Edward. Hybrid T-junction switch. 4,217,565, Cl. 333-258.000.
Sandowicz, Michal; Wiaderek, Krzysztof; and Hamann, Waldemar, to Politechnika Warszawska. Machine for molding pipe-type elements such as steel fabric reinforced concrete pipes. 4,217,080, Cl. 425-95.000.
Sandoz Ltd.: *See*—
Neumann, Peter, 4,217,356, Cl. 424-270.000.
Sangamo Weston, Inc.: *See*—
Dalley, Robert J.; and Owen, Robert D., 4,217,634, Cl. 363-89.000.
Sankyo Company Ltd.: *See*—
Saito, Yukio; Sekiya, Koichi; and Takahashi, Masaaki, 4,217,107, Cl. 23-230.00B.
Sano, Shoichi: *See*—
Osada, Isao; and Sano, Shoichi, 4,216,810, Cl. 152-158.000.
Santa Fe International Corporation: *See*—
Chang, Nuke M.; and Renshaw, Robin, 4,216,896, Cl. 228-212.000.
Sanyo Electric Co., Ltd.: *See*—
Sawazaki, Tamaki, 4,217,149, Cl. 148-1.500.
Sarstedt, Walter. Device for the extraction of blood. 4,216,782, Cl. 128-764.000.
Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process and composition for removing carbon dioxide containing acidic gases from gaseous mixtures. 4,217,236, Cl. 252-189.000.
Sartori, Guido; and Leder, Frederic, to Exxon Research & Engineering Co. Process for removing carbon dioxide containing acidic gases from gaseous mixtures using a basic salt activated with a hindered amine. 4,217,237, Cl. 252-192.000.

Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process for removing acid gases with hindered amines and amino acids. 4,217,238, Cl. 252-192.000.

Sasajima, Kikuo: *See*—
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Sasaki, Tadao; Komaru, Isamu; and Yoshioka, Ryuzo, to Nippon Crucible Co., Ltd. Process for producing β-silicon carbide fine powder. 4,217,335, Cl. 423-345.000.

Sasaki, Toshio: *See*—
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,217,432, Cl. 526-119.000.

Sato, Eiji: *See*—
Tojo, Kenji; Kousokabe, Hirokatu; Arai, Nobukatsu; and Sato, Eiji, 4,216,661, Cl. 62-505.000.

Sato, Kimihiko: *See*—
Nakaya, Keiichi; Sato, Kimihiko; and Konishi, Kenji, 4,217,330, Cl. 422-193.000.

Sato, Shuichi; Yamaguchi, Tadanori; and Ritchie, Arthur D., to Tektronix, Inc. Narrow channel MOS devices and method of manufacturing. 4,217,599, Cl. 357-23.000.

Sato, Yasuhisa; Tajima, Akira; and Ono, Yukiharu, to Canon Kabushiki Kaisha. Photographic camera with an image of exposure condition indicia visible through a view-finder thereof. 4,217,050, Cl. 354-225.000.

Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Cartridge-type ink supply device for labeling machines. 4,216,715, Cl. 101-103.000.

Sauers, Richard F., to Du Pont de Nemours, E. I., and Company. 1-Alkyl-2,2-dichloro-2(phosphinyl)acetates. 4,217,312, Cl. 260-941.000.

Savage, David W.: *See*—
Sartori, Guido; and Savage, David W., 4,217,236, Cl. 252-189.000.
Sartori, Guido; and Savage, David W., 4,217,238, Cl. 252-192.000.

Savides, Christos: *See*—
Hoffman, Joseph A.; Savides, Christos; and Oppelt, John C., 4,217,267, Cl. 260-45.75D.

Savitz, Christian W.: *See*—
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., 4,216,630, Cl. 51-170.00T.

Sawafuji Electric Co., Ltd.: *See*—
Izumi, Toshio, 4,217,536, Cl. 320-48.000.

Sawazaki, Tamaki, to Sanyo Electric Co., Ltd.; and Tokyo Sanyo Electric Co., Ltd. Method of manufacturing complementary insulated gate field effect semiconductor device by multiple implantations and diffusion. 4,217,149, Cl. 148-1.500.

Sawitzki, Friedhelm: *See*—
Fullmann, Marius; Sawitzki, Friedhelm; and Silber, Dieter, 4,217,504, Cl. 307-252.00C.

Sawyer, Robert E., Jr.; and Donahue, Robert J., to Northern Telecom, Inc. Level selective a-c monitoring circuit. 4,217,506, Cl. 307-360.000.

Schafer, Peter: *See*—
Blankenburg, Heinz; Schafer, Peter; and Herrmann, Friedrich, 4,216,624, Cl. 49-352.000.

Schafer, Richard A., to Deere & Company. Tractor hitch. 4,216,975, Cl. 280-461.00A.

Schaffer, Michael J., to General Atomic Company. Blanket design for imploding liner systems. 4,217,171, Cl. 176-7.000.

Schaub, Charles T., to Coleco Industries, Inc. Disposable float dispenser. 4,217,331, Cl. 422-265.000.

Scheffer, Terry J.: *See*—
Doriguzzi, Rino; Egloff, Markus; Kaufmann, Meinolph; and Scheffer, Terry J., 4,217,035, Cl. 350-338.000.

Schell, Ronald F.: *See*—
Le Frock, Jack L.; and Schell, Ronald F., 4,217,411, Cl. 435-34.000.

Schering Aktiengesellschaft: *See*—
Vorbrueggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,217,360, Cl. 424-278.000.

Scheying, Hans; and Schleupen, Richard, to Robert Bosch GmbH. Apparatus for preventing malfunction in a circuit controlling an electrical component maintaining a residual voltage after removal of energization. 4,217,528, Cl. 318-293.000.

Schilt, Marvin H.: *See*—
Henry, Donald E.; Murrell, Thomas A.; Schilt, Marvin H.; and Weaver, Alfred C., 4,217,658, Cl. 364-900.000.

Schleupen, Richard: *See*—
Scheying, Hans; and Schleupen, Richard, 4,217,528, Cl. 318-293.000.

Schlobohm, Arnold: *See*—
Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, 4,216,726, Cl. 410-64.000.

Schmid, Karl: *See*—
Kelemen, Jozsef; Kuhl, Eickhard; and Schmid, Karl, 4,217,239, Cl. 252-301.170.

Schmidt, Johannes E.: *See*—
Hohenschutz, Heinz; Schmidt, Johannes E.; and Kiefer, Hans, 4,217,460, Cl. 562-609.000.

Schmidt, Maria, to Inzuki Buero Fuer Technische Projekte und Patente Aktiengesellschaft. Installation and method for vegetable cultivation. 4,216,617, Cl. 47-62.000.

Schmidt, Rainer. Deburring apparatus. 4,216,560, Cl. 15-21.00D.

Schmidt, Thomas R., to Shell Oil Company. Method and apparatus for improved temperature compensation in a corrosion measurement system. 4,217,544, Cl. 324-65.0CR.

Schmitt, Frederick L., to International Flavors & Fragrances Inc. Mixture of 3-methyl-1-phenyl-pentanol-5 or its isomers and butanoyl cyclohexane derivatives. 4,217,253, Cl. 252-522.00R.

Schmitt, Frederick L.: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,217,371, Cl. 426-538.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.

Schneider, Alan A.: *See*—
O'Boyle, Matthew; Schneider, Alan A.; and Magladry, Ross E., 4,217,403, Cl. 429-162.000.

Schneider, Wolfgang; Von Praun, Ferdinand; and Niehaves, Kurt, to Chemische Werke Huls A.G. Alkaline baths containing alkene sulfonates as wetting agents. 4,217,106, Cl. 8-127.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Onisko, Bruce L., 4,217,288, Cl. 260-397.200.

Schnug, Lieselotte, to EDV-Druck Walter Schnug KG. Multiple sets, particularly endless sets. 4,217,384, Cl. 428-138.000.

Schoenberger, Eva: *See*—
Haber, Raphael R. G.; and Schoenberger, Eva, 4,217,456, Cl. 546-167.000.

Schoeneweis, E. Frederick, to Rockwell International Corporation. Valve actuator. 4,216,703, Cl. 92-63.000.

Schrader, Donald E., to Nashville Wire Products Manufacturing Co., Inc. Deck channel for storage rack beam. 4,216,729, Cl. 108-159.000.

Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid bis-diphenol esters of polyalkylene oxide-diols lengthened via carbonate groups and their use for the preparation of high-molecular, segmented polyether/polycarbonates which can be processed as thermoplastics. 4,217,437, Cl. 528-171.000.

Schreckenberg, Manfred: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.

Schrittwieser, Karl, to Sintermetallwerk Krebsoge GmbH. Process for producing hard, wear-resistant boron-containing metal bodies. 4,217,141, Cl. 75-244.000.

Schroeder, Helmut: *See*—
Melzer, Werner; Jaenicke, Dieter; and Schroeder, Helmut, 4,217,108, Cl. 23-230.0PC.

Schroter, Herbert: *See*—
Eichenberger, Kurt; Kuhnis, Hans; Ostermayer, Franz; and Schroter, Herbert, 4,217,350, Cl. 424-250.000.

Schuberth, Ralph G.: *See*—
Hartley, Henry F.; and Schuberth, Ralph G., 4,217,639, Cl. 364-200.000.

Schultz, Gary W. Water inlet adapter valve for boats. 4,216,558, Cl. 9-1.100.

Schuster, Karl, to Siemens Aktiengesellschaft. Device for the separation of minute magnetizable particles, method and apparatus. 4,217,213, Cl. 210-42.00S.

Schuttler, William K.: *See*—
McNinch, Delmar; and Schuttler, William K., 4,216,986, Cl. 292-341.170.

Schutz, Hans U., to Ciba-Geigy Corporation. Sulfo substituted chromium containing azo pyrazolone dyestuff. 4,217,270, Cl. 260-145.00B.

Schwab, Carl E., to General Signal Corporation. Quasi-linear antenna array. 4,217,592, Cl. 343-844.000.

Schwaebel, Richard: *See*—
Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, 4,217,103, Cl. 8-66.000.

Schwartz, Herbert M., to RCA Corporation. Magnetic transducer head core. 4,217,613, Cl. 360-119.000.

Schwartz, James W.: *See*—
Dietch, Leonard; and Schwartz, James W., 4,217,521, Cl. 313-479.000.

Schwarz, Norbert: *See*—
Vorbrueggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, 4,217,360, Cl. 424-278.000.

Schwarz, Rudolf: *See*—
Weigert, Wolfgang; Meyer-Simon, Eugen; and Schwarz, Rudolf, 4,217,334, Cl. 423-342.000.

Schwert, Martin: *See*—
Harder, Klaus; and Schwert, Martin, 4,217,197, Cl. 204-243.00R.

Sciacca, James C.: *See*—
Bader, James S.; and Sciacca, James C., 4,216,859, Cl. 206-159.000.

Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, to Xerox Corporation. Beam scanning using radiation pattern distortion. 4,217,561, Cl. 331-94.50H.

Scott, Michael A.; Brown, Albert E.; and Young, Edward, to Columbia Ribbon and Carbon Mfg. Co., Inc. Pressure-sensitive transfer elements and process. 4,217,388, Cl. 428-307.000.

Sedam, Jason K., to Coca-Cola Company, The. Disposable package for dispensing liquids with a controlled rate of flow. 4,216,885, Cl. 222-481.000.

Seelenbinder, Terry G., to AM International, Inc. Rotary electric receptacle. 4,217,016, Cl. 339-5.00M.

Seever, John. Method and apparatus for the cleaning of the surface of filter panels in a fluid passageway. 4,217,116, Cl. 55-96.000.

Seiko Koki Kabushiki Kaisha: *See*—
Kitai, Kiyoshi; Morino, Yukio; Kato, Shogo; and Nemoto, Ichiro, 4,217,049, Cl. 354-195.000.
Nakagawa, Tadashi; and Nemoto, Ichiro, 4,217,051, Cl. 354-226.000.

Sekiguchi, Tetsuo: *See*—
Minagawa, Motonobu; Sekiguchi, Tetsuo; and Nakazawa, Kenji, 4,217,258, Cl. 260-23.0XA.

Sekiya, Fukuo: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,217,654, Cl. 364-705.000.

Sekiya, Koichi: *See*—
Saito, Yukio; Sekiya, Koichi; and Takahashi, Masaaki, 4,217,107, Cl. 23-230.00B.

Sekmakas, Kazys; Shah, Raj; and DeRossi, John D., to DeSoto, Inc. Air drying thermosetting aqueous epoxy-acrylic copolymer coating systems. 4,217,261, Cl. 260-29.6NR.

Seppi, Edward J.: *See*—
Racz, Janos A.; and Seppi, Edward J., 4,217,498, Cl. 250-385.000.
Racz, Janos A.; and Seppi, Edward J., 4,217,499, Cl. 250-445.00T.

Sergeev, Igor A.: *See*—
Baburin, Sergei V.; Gorbushin, Vladimir A.; Muraviev, Alexandr P.; Nepein, Valery N.; Frolov, Mikhail V.; Aizenberg, Sergei A.; Golovko, Evgeny H.; Kamenev, Alexandr F.; and Sergeev, Igor A., 4,217,169, Cl. 162-100.000.

Settlemire, Eugene F., to Webb, Austin A. Plural key operated totalizers for gasoline sales pump. 4,217,485, Cl. 235-94.00R.

Sevostianova, Ljudmila B.: *See*—
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.

Seyler, Jay K.: *See*—
Hughes, John L.; Seyler, Jay K.; and Liu, Robert C., 4,217,268, Cl. 260-112.50T.

Seymour-Smith, Donald, to A. J. Bingley Limited. Bag pack. 4,216,863, Cl. 206-554.000.

Shacklock, Frank W., to Fisher & Paykel Limited. Rotatable laundry machine drum. 4,216,663, Cl. 68-3.00R.

Shaffer, Robert: *See*—
Stiller, Richard L.; Shaffer, Robert; Smith, Edward H.; and Vollmer, Regis R., 4,216,569, Cl. 29-157.30C.

Shah, Raj: *See*—
Sekmakas, Kazys; Shah, Raj; and DeRossi, John D., 4,217,261, Cl. 260-29.6NR.

Sharp Kabushiki Kaisha: *See*—
Hamada, Hiroshi; Nakauchi, Hiroshi; Inami, Yasuhiko; and Uede, Hisashi, 4,217,579, Cl. 340-763.000.
Matsubara, Sigeo; and Tsuda, Tatsuya, 4,217,477, Cl. 219-10.55B.

Sharpe, Cecil H.: *See*—
Herman, Avrum S.; Reider, Samuel B.; and Sharpe, Cecil H., 4,216,652, Cl. 60-748.000.

Shay, Greg D.; and Griffith, James H., to Sherwin-Williams Company, The. Crosslinking agent for powder coatings. 4,217,377, Cl. 427-195.000.

Sheem, Sang K. End-butt optical fiber coupler. 4,217,032, Cl. 350-96.210.

Shell Oil Company: *See*—
Mason, Ronald F.; and Devlin, Barry R. J., 4,217,283, Cl. 260-326.50B.
Schmidt, Thomas R., 4,217,544, Cl. 324-65.0CR.
Verschuur, Eke; and Masdin, Edward G., 4,217,110, Cl. 44-51.000.

Shelly, William A.: *See*—
Porter, Marion G.; Ryan, Charles P.; and Shelly, William A., 4,217,640, Cl. 364-200.000.

Shelton, James L. Valve system for control of paint to spreader. 4,217,059, Cl. 401-219.000.

Shemchek, Stanley A.: *See*—
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., 4,217,383, Cl. 428-95.000.

Shen, Tsung-Ying; Jones, Howard; and Dorn, Conrad P., to Merck & Co., Inc. Anti-inflammatory 4H-1,3-oxathiino(4,5-c). 4,217,352, Cl. 424-256.000.

Shen, Tsung-Ying: *See*—
Wagner, Arthur F.; Grier, Nathaniel; and Shen, Tsung-Ying, 4,217,429, Cl. 525-411.000.

Shephard, Margaret C.; and Worthington, Paul A., to Imperial Chemical Industries Limited. Fungicidal and herbicidal triazole ketones. 4,217,129, Cl. 71-76.000.

Sherwin-Williams Company, The: *See*—
Shay, Greg D.; and Griffith, James H., 4,217,377, Cl. 427-195.000.

Shifflett, David C.: *See*—
Hough, Louis E.; and Shifflett, David C., 4,216,983, Cl. 292-263.000.

Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, to Sumitomo Chemical Company, Limited. Process for the polymerization of olefins. 4,217,432, Cl. 526-119.000.

Shigemune, Toshiaki: *See*—
Shikata, Kazuo; and Shigemune, Toshiaki, 4,217,298, Cl. 260-463.000.

Shiiyama, Hideo: *See*—
Hayashi, Tetsuaki; Shiiyama, Hideo; Kinoshita, Mikio; and Nagai, Hiroshi, 4,216,680, Cl. 74-473.00R.

Shikata, Kazuo; and Shigemune, Toshiaki, to Tokuyama Soda Kabushiki Kaisha. Process for preparing organic carbonates. 4,217,298, Cl. 260-463.000.

Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, to Nippon Kokan Kabushiki Kaisha; and Shinagawa Shiro Renga Kabushiki Kaisha. Casting vessel having basic lining. 4,216,944, Cl. 266-44.000.

Shimazu, Jyoji: *See*—
Hirano, Reiji; Mochizuki, Koichi; Yasui, Tokio; and Shimazu, Jyoji, 4,217,656, Cl. 364-710.000.

Shimodaira, Toyohisa, to Hitachi, Ltd. Centrifugal braking device. 4,216,848, Cl. 188-71.200.

Shimotsuma, Nobuo, to Kabushiki Kaisha Daini Seikosha. Voltage regulated electronic timepiece. 4,217,540, Cl. 323-22.00R.

Shinagawa Shiro Renga Kabushiki Kaisha: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.

Shinohara, Masanao; Nakano, Yoshimasa; Kaise, Hirotsugu; Izawa, Taketoshi; and Miyazaki, Wasei, to Otsuka Pharmaceutical Co., Ltd. 3-0-(β-D-Glucuronopyranosyl)-soyasapogenol B. 4,217,345, Cl. 424-180.000.

Shinsei Kinzoku Seisakusho: *See*—
Inaba, Yoshisada, 4,216,995, Cl. 297-443.000.

Shiraki, Ryuzo: *See*—
Suzuki, Yasoji; and Shiraki, Ryuzo, 4,217,502, Cl. 307-205.000.

Shishkin, Jury N.: *See*—
Dmitrievsky, Anatoly V.; Kamenev, Vladimir F.; Pashin, Jury M.; Prudov, Nikolai M.; Simatov, Alexandr I.; Tjufyakov, Andrei S.; Shishkin, Jury N.; and Yamolov, Jury I., 4,217,313, Cl. 261-41.00D.

Shortway, Harry A.; Graham, Alan A.; and Miller, Charles H., to Congoleum Corporation. Resinous polymer sheet materials having selective, surface decorative effects and methods of making the same. 4,217,385, Cl. 428-159.000.

Showalter, Joseph S., to Boone Bait Company, Inc. Method of making a fishing lure. 4,216,605, Cl. 43-42.530.

Shreve, Marshall T., to Martec Industries Inc. Safety shield for flanged pipe coupling. 4,216,980, Cl. 285-13.000.

Shuler, Bernard R., to American Air Filter Company, Inc. Filter retaining latch. 4,217,122, Cl. 55-480.000.

Shumaker, Gordon W., to Space Tables, Inc. Table and seat apparatus. 4,216,993, Cl. 297-157.000.

Siegrist, Adolf E.; and Coviello, Vincenzo, to Ciba-Geigy Corporation. Cyano-substituted stilbene compounds. 4,217,301, Cl. 260-465.00G.

Siemens Aktiengesellschaft: *See*—
Huebner, Wolfgang, 4,217,017, Cl. 339-17.00F.
Schuster, Karl, 4,217,213, Cl. 210-42.00S.

Siemon Company, The: *See*—
Knickerbocker, Robert H., 4,216,934, Cl. 248-309.00A.

Sieweke, Wilhelm; Nettler, Hubert; and Burmann, Jurgen, to Paul Wurth S.A. Gate arrangement for counterpressure blast furnaces. 4,216,946, Cl. 266-87.000.

Siewert, Wolfgang: *See*—
Kahmann, Albrecht; and Siewert, Wolfgang, 4,216,918, Cl. 241-46.00B.

Silber, Dieter: *See*—
Fullmann, Marius; Sawitzki, Friedhelm; and Silber, Dieter, 4,217,504, Cl. 307-252.00C.

Silberberg, Jeffrey L.: *See*—
Daniels, Charles J.; and Silberberg, Jeffrey L., 4,217,496, Cl. 250-369.000.
Daniels, Charles J.; and Silberberg, Jeffrey L., 4,217,497, Cl. 250-369.000.

Silbernagel, Hermann. Stand for supporting a sign or signholder. 4,216,932, Cl. 248-156.000.

Silver Seiko Ltd.: *See*—
Oka, Hirokazu, 4,217,056, Cl. 400-368.000.

Silver, Stanley M. Plant watering system and process. 4,216,623, Cl. 47-80.000.

Simatov, Alexandr I.: *See*—
Dmitrievsky, Anatoly V.; Kamenev, Vladimir F.; Pashin, Jury M.; Prudov, Nikolai M.; Simatov, Alexandr I.; Tjufyakov, Andrei S.; Shishkin, Jury N.; and Yamolov, Jury I., 4,217,313, Cl. 261-41.00D.

Simazaki, Yuzuru; Doi, Ryota; Kumagai, Yuji; Fukazawa, Ikou; and Yamaguchi, Motoo, to Hitachi, Ltd. Stator structure for induction motor. 4,217,514, Cl. 310-260.000.

Siminovich, Samuel, to Araley, S.A. Proportioner of liquids. 4,216,792, Cl. 137-209.000.

Simpson, Lee. Simulated wire wheel cover. 4,217,002, Cl. 301-37.0CM.

Singer Company, The: *See*—
Caltagirone, Anthony V.; Bradford, George J.; and Parro, James J., 4,217,646, Cl. 364-493.000.
Jaffe, Wolfgang; and Peterson, Wesley R., 4,217,507, Cl. 310-12.000.
Kornatowski, Boleslaw, 4,216,733, Cl. 112-184.000.
Marsh, Walter H.; Beckerman, Howard L.; and Dob, Allan M., 4,216,732, Cl. 112-158.00B.
Minalga, Philip F., 4,217,531, Cl. 318-677.000.
Ryer, Richard N., II, 4,216,631, Cl. 51-170.0MT.
Totino, Peter J., 4,216,734, Cl. 112-320.000.
Yazawa, Fumihiko, 4,216,731, Cl. 112-158.00B.

Sintermetallwerk Krebsoge GmbH: *See*—
Schrittwieser, Karl, 4,217,141, Cl. 75-244.000.

Siwersson, Olle L.; Wall, Arne E.; and Loodberg, Jan A. T., to AB Scaniainventor. Composition comprising a pulverized purified sub-

stance, water and a dispersing agent, and a method for preparing the composition. 4,217,109, Cl. 44-1.0SR.
Sjoholm, Claes B.; and Johansson, Bengt O., to Alfa-Laval AB. Process control valve apparatus. 4,217,647, Cl. 364-510.000.
Skjelby, Finn: *See*—
Slungaard, Svein; Frydendal, Tom; and Skjelby, Finn, 4,217,156, Cl. 156-69.000.
Skoli, Sigmund P.; and Mojonnier, Harry G., to Mojonnier Bros. Co. Deoxygenation system for production of beer. 4,216,711, Cl. 99-277.200.
Skorczyk, Ronald: *See*—
Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, 4,217,431, Cl. 526-68.000.
Skulley, Gerald W.: *See*—
Jalbert, Bernard W.; Skulley, Gerald W.; and Wahl, James A., 4,216,847, Cl. 187-9.00R.
Slavinsky, Roma. Padlock. 4,216,664, Cl. 70-39.000.
Slungaard, Svein; Frydendal, Tom; and Skjelby, Finn, to Elopak A/S. Method for sealing a plastics lid to a container of plastics-coated paper board and apparatus for carrying out the method. 4,217,156, Cl. 156-69.000.
Smart, William L.; Hoenig, Stuart A.; Savitz, Christian W.; and Darlington, Douglas K., to Aro Corporation, The. Grinder apparatus with pollution control fluid dispensing means. 4,216,630, Cl. 51-170.00T.
Smith, Dewey H., Jr., to Du Pont de Nemours, E. I., and Company. Method for inducing anorexia. 4,217,353, Cl. 424-260.000.
Smith, Edward H.: *See*—
Stiller, Richard L.; Shaffer, Robert; Smith, Edward H.; and Vollmer, Regis R., 4,216,569, Cl. 29-157.30C.
Smith, Edward W.: *See*—
Paraskos, John A.; and Smith, Edward W., 4,217,202, Cl. 208-11.0LE.
Smith, George E.; and Tompsett, Michael F., to Bell Telephone Laboratories, Incorporated. Charge transfer logic apparatus. 4,217,600, Cl. 357-24.000.
Smith, George L.; and Smith, Leslie J. Apparatus for the production of plastics articles. 4,217,079, Cl. 425-89.000.
Smith, Leslie J.: *See*—
Smith, George L.; and Smith, Leslie J., 4,217,079, Cl. 425-89.000.
Smith, Richard L., Jr., to SSC Industries, Inc. Product for and process of delinting cottonseed. 4,216,616, Cl. 47-58.000.
Smith, Robert L., to Diamond Shamrock (Polymers) Limited. Resin chelates. 4,217,417, Cl. 435-180.000.
Smith, William E.: *See*—
Brunelle, Daniel J.; and Smith, William E., 4,217,438, Cl. 528-202.000.
Snamprogetti, S.p.A.: *See*—
Corbellini, Margherita; Gamba, Alessandro; and Busetto, Carlo, 4,217,245, Cl. 252-429.00B.
Lagana', Vincenzo; and Zardi, Umberto, 4,217,114, Cl. 55-70.000.
Snee, David: *See*—
Kim, Han J.; Peters, Thomas E.; and Snee, David, 4,217,139, Cl. 75-206.000.
Snyder, Fred E.: *See*—
Vogel, Alan D.; and Snyder, Fred E., 4,217,483, Cl. 219-541.000.
Socapex: *See*—
Carre, Jacques, 4,217,022, Cl. 339-99.00R.
Jacques, Andre; Malsot, Christian; Moronvalle, Chantal; and Bertau, Edith, 4,217,084, Cl. 425-321.000.
Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See*—
Lotte, Andre; and Gross, Raymond, 4,216,888, Cl. 226-104.000.
Societe Anonyme Automobiles Citroen: *See*—
Mauron, Gerard, 4,216,978, Cl. 280-803.000.
Societe Anonyme, Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
Brzozowski, Henri, 4,217,554, Cl. 330-124.00R.
Societe Anonyme de Telecommunications: *See*—
Cohen, Jean-Pierre D., 4,217,607, Cl. 358-109.000.
S.A. Delta Neu: *See*—
Neu, Francis, 4,217,317, Cl. 261-160.000.
Societe Anonyme dite: La Telephonie Industrielle et Commerciale-TELIC: *See*—
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,217,503, Cl. 307-237.000.
Societe Anonyme dite: Technime S.A.: *See*—
Heidenreich, Johann, 4,217,210, Cl. 210-28.000.
Societe Francaise des Products pour Catalyse: *See*—
Marcilly, Christian; Le Page, Jean-Francois; Martino, Germain; and Miquel, Jean, 4,217,205, Cl. 208-139.000.
Societe Generale des Eaux Minerales de Vittel: *See*—
Gautier, Raoul L. A., 4,216,639, Cl. 53-413.000.
Societe l'Electricfil: *See*—
Trigon, Jean F., 4,216,578, Cl. 29-857.000.
Societe pour l'Equipement de Vehicules: *See*—
Ordines, Jean-Pierre, 4,216,755, Cl. 123-643.000.
Soderberg, Tore S. E.; and Jonsson, Kenneth J. Hothouse. 4,216,615, Cl. 47-17.000.
Sommer, John G.: *See*—
Kuan, Tiong Ho; and Sommer, John G., 4,217,395, Cl. 428-494.000.
Sonin, Erik V.: *See*—
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.
Sontheimer, Carl G.: *See*—
Clare, Richard D.; and Sontheimer, Carl G., 4,216,917, Cl. 241-37.500.
Sony Corporation: *See*—
Matsumoto, Shigeo; Tago, Koichi; and Kato, Hidetoshi, 4,217,015, Cl. 316-30.000.
Mogi, Takao; Morita, Koji; and Okada, Hisao, 4,217,552, Cl. 455-164.000.
Okada, Takashi, 4,217,539, Cl. 323-4.000.
Uzuka, Mitsuo, 4,217,508, Cl. 310-46.000.
Sorensen, Bendt D., to V. Kann Rasmussen Holding A/S. Window lock operating device. 4,216,985, Cl. 292-336.300.
Soussan, Salomon: *See*—
Pompon, Jean-Bernard; and Soussan, Salomon, 4,217,444, Cl. 528-499.000.
Sowter, Brian R.: *See*—
Roe, David; and Sowter, Brian R., 4,217,577, Cl. 340-703.000.
Space Tables, Inc.: *See*—
Shumaker, Gordon W., 4,216,993, Cl. 297-157.000.
Spalinger, Hugo: *See*—
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, 4,217,479, Cl. 219-121.00P.
Spanel, Abram N.: *See*—
Eiland, P. Frank; and Jacobs, David R., 4,217,061, Cl. 403-313.000.
Spaziante, Placido M.: *See*—
Pellegri, Alberto; and Spaziante, Placido M., 4,217,401, Cl. 429-39.000.
Spectrum X-Ray Corporation: *See*—
Hogan, William F., 4,217,064, Cl. 403-33.000.
Spencer, William R.: *See*—
Henry, George R.; and Spencer, William R., 4,216,672, Cl. 73-115.000.
Sperry Corporation: *See*—
Koch, Earl E.; and Ehrhart, Philip J., 4,216,641, Cl. 56-14.400.
Spiro Investment S.A.: *See*—
Jensen, Tor A., 4,216,981, Cl. 285-97.000.
Spratt, Donald E.; and Spratt, Franklin D., to Spratt, Donald E. Tobacco harvesting method and apparatus. 4,216,642, Cl. 56-27.500.
Spratt, Franklin D.: *See*—
Spratt, Donald E.; and Spratt, Franklin D., 4,216,642, Cl. 56-27.500.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Flavoring with cyclohexene methanol lower alkyl esters. 4,217,371, Cl. 426-538.000.
Squires, W. David; Anderson, Donald L.; and Cherry, Isaac R., to Del Mar Avionics. Blood pressure monitoring system. 4,216,779, Cl. 128-682.000.
SSC Industries, Inc.: *See*—
Smith, Richard L., Jr., 4,216,616, Cl. 47-58.000.
Staat, Robert H.: *See*—
Suddick, Richard P.; Staat, Robert H.; and Doyle, Ronald J., 4,217,341, Cl. 424-48.000.
Staebler, David L.; and Zanzucchi, Peter J., to RCA Corporation. Method of inducing differential etch rates in glow discharge produced amorphous silicon. 4,217,393, Cl. 428-450.000.
Stahler, Alfred F. Ground and/or feedline independent resonant feed device for coupling antennas and the like. 4,217,589, Cl. 343-722.000.
Stammen, Harold A.: *See*—
Leasor, Paul J.; Pulskamp, Gerald S.; and Stammen, Harold A., 4,217,074, Cl. 414-642.000.
Standal, Norman S. Irrigation water discharge valve. 4,216,794, Cl. 137-322.000.
Standard-Knapp, Inc.: *See*—
Raudat, John L., 4,216,855, Cl. 198-633.000.
Standard Oil Company (Indiana): *See*—
Hughes, Donald R.; Gumma, William H.; and Zimmerman, Neil S., 4,217,571, Cl. 367-37.000.
King, George E., 4,217,231, Cl. 252-8.55R.
Stanish, Walter F. Combination utensil and lid for packaged comestibles. 4,216,875, Cl. 220-212.000.
Stapla Hans-Dieter Golde GmbH & Co KG: *See*—
Golde, Hans-Dieter, 4,216,557, Cl. 6-10.000.
Starke, Burnett H. Fishing rod tip guard. 4,216,604, Cl. 43-25.200.
Starkweather, Howard W., Jr.; and Mutz, Michael J., to Du Pont de Nemours, E. I., and Company. Graft copolymer of neutralized acid copolymer trunk and polyamide oligomeric branches and method for making such copolymer. 4,217,430, Cl. 525-183.000.
Starp, Franz, to Prontor-Werk Alfred Gauthier G.m.b.H. Machine for grinding and polishing workpieces. 4,216,626, Cl. 51-58.000.
Staub, Hans-Rudolf: *See*—
Egli, Rene; Staub, Hans-Rudolf; and Feneberger, Kurt, 4,217,220, Cl. 210-79.000.
Stauffer Chemical Company: *See*—
Koeble, Earl A., 4,217,434, Cl. 525-329.000.
Kuck, Mark A.; and Miller, Gary K., 4,217,184, Cl. 204-59.0QM.
Ste d'Application Plastique, Mecanique et Electronique Plastimecanique S.A.: *See*—
Utzmann, Rene; and Dronet, Jean M., 4,217,163, Cl. 156-361.000.
Steffan, Guido; Borgmann, Ernst; Buchel, Peter; and Harms, Wolfgang, to Bayer Aktiengesellschaft, DEX. Process for removing heavy metal sulphides from aqueous systems. 4,217,209, Cl. 210-53.000.
Stegmeier, William R. Fireplace air distribution system. 4,216,761, Cl. 126-120.000.
Steimle, Anthony R.: *See*—
Cancio, Leo V.; Miller, Gerald W.; Mortellite, Robert M.; Steimle, Anthony R.; and Peterson, Brian P., 4,217,327, Cl. 264-293.000.

Steinlehner, Fritz; and Weidlich, Dieter, to AGFA-Gevaert, A.G. Fixing arrangement in electrostatic copying machine. 4,217,093, Cl. 432-59.000.

Stephenson, Earle W.; and Hutzell, Clyde G., to Kennametal Inc. Furrowing tool. 4,216,832, Cl. 172-540.000.

Sterling Drug Inc.: *See*—
Crounse, Nathan N., 4,217,272, Cl. 260-163.000.
Diana, Guy D., 4,217,346, Cl. 424-214.000.
Farah, Alfred E., 4,217,354, Cl. 424-267.000.

Sterling Durg Inc.: *See*—
Bauer, Gerald L., 4,217,218, Cl. 210-63.00R.

Steward, Charles L.: *See*—
Gastrock, Edward A., 4,216,796, Cl. 137-571.000.

Stichweh Verwaltungs-GmbH: *See*—
Fiebig, Horst, 4,216,997, Cl. 299-9.000.

Stiftelsen Institutet for Mikrovagsteknik vid Tekniska Hogskolan I Stockholm: *See*—
Henoch, Bengt, 4,217,549, Cl. 455-81.000.

Stiller, Richard L.; Shaffer, Robert; Smith, Edward H.; and Vollmer, Regis R., to Westinghouse Electric Corp. Method for installing a tube in a heat exchanger tube sheet. 4,216,569, Cl. 29-157.30C.

Stilwell, Leo J. Slip-form curb and gutter machine. 4,217,065, Cl. 404-98.000.

Stingl, Hans A., to Toms River Chemical Company. Polyamides dyed with rubine disazo acid dyes and process therefore. 4,217,102, Cl. 8-662.000.

Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., to Tennessee Valley Authority. Production of urea-ammonium polyphosphates from urea phosphate. 4,217,128, Cl. 71-29.000.

Stoffels, Carl A., to Judelshon Industries, Inc. Rotary cutting mechanism. 4,216,686, Cl. 82-53.000.

Stoller, Patricia S.; Hammonds, James C.; Kloepper, John O.; and Schlobohm, Arnold, to ACF Industries, Incorporated. Railway trailer hitch stand pivoting one-way gate. 4,216,726, Cl. 410-64.000.

Stoltz, Richard J., to R. J. Stoltz Enterprises Inc. Storm drainage systems. 4,216,790, Cl. 137-357.000.

Stoltze, Leon; Nutter, Harry A., Jr.; and Wilson, Robert F., to United Technologies Corporation. Method of fabricating fiber-reinforced articles. 4,217,157, Cl. 156-87.000.

Stone, W. James: *See*—
Hooper, John O.; Stone, W. James; and Burklund, Vernon D., 4,216,928, Cl. 244-122.0AD.

Stone, Willice D. Alignment indicator clamp apparatus. 4,216,587, Cl. 33-180.00R.

Strahs, Martin P., to Quickie Manufacturing Corporation. Sponge mop refill. 4,216,562, Cl. 15-119.00A.

Straszewski, Klaus; Rauterberg, Jochen; and Zuchner, Werner, to Koh-I-Noor Rapidograph, Inc. Reservoir cartridge for writing pens. 4,217,058, Cl. 401-135.000.

Strauss, Herbert S., to Duro-Test Corporation. Mechanical safety switch for high intensity discharge lamps. 4,217,522, Cl. 315-73.000.

Streifer, William: *See*—
Scifres, Donald R.; Burnham, Robert D.; and Streifer, William, 4,217,561, Cl. 331-94.50H.

Strizhevsky, Dmitry L.: *See*—
Puschalovsky, Anton D.; Prokopenko, Leonid I.; and Strizhevsky, Dmitry L., 4,216,886, Cl. 222-595.000.

Strong, Norman H., to John Fluke Mfg. Co., Inc. Digital conductance meter. 4,217,543, Cl. 324-62.000.

Struthers-Dunn, Inc.: *See*—
Henry, Donald E.; Murrell, Thomas A.; Schilt, Marvin H.; and Weaver, Alfred C., 4,217,658, Cl. 364-900.000.

Sturm, Michael R., to Display Corporation International. Display rack having stacked display trays. 4,216,867, Cl. 211-77.000.

Su, Kai C.: *See*—
Letter, Eugene C.; and Su, Kai C., 4,217,038, Cl. 351-160.00R.

Suddick, Richard P.; Staat, Robert H.; and Doyle, Ronald J., to University of Louisville, The. Composition and method for inhibiting the adherence of dental plaque-producing bacteria to smooth surfaces. 4,217,341, Cl. 424-48.000.

Sudler, Roland, to Quarz-Zeit AG. Single phase stepping motor. 4,217,509, Cl. 310-49.00R.

Sugano, Katsumi; Hashimoto, Takeshi; Hashizume, Shinzi; Ikegami, Yoshio; and Fukumizu, Shin'ichi, to Kobe Steel, Limited. Process for extruding synthetic resin and die for use therein. 4,217,322, Cl. 264-176.00R.

Sugarman, Meyer L., to Zenith Radio Corporation. Image display faceplate having a chromatic matrix. 4,217,520, Cl. 313-472.000.

Sugiyama, Takahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Retrofocus type wide angle photographic lens. 4,217,034, Cl. 350-214.000.

Suh, Nam P.; Fillion, Paul D.; and Lee, Sang H., to Massachusetts Institute of Technology. Aluminum oxide-containing metal compositions and cutting tool made therefrom. 4,217,113, Cl. 51-309.000.

Suhling, Peter. Weight controlled bread loaf slicer. 4,216,689, Cl. 83-77.000.

Suling, Carlhans: *See*—
Lindner, Christian; Suling, Carlhans; Bartl, Herbert; Schreckenberg, Manfred; Freitag, Dieter; and Konig, Klaus, 4,217,297, Cl. 260-463.000.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,217,437, Cl. 528-171.000.

Sumitomo Chemical Company, Limited: *See*—
Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,217,349, Cl. 424-248.400.
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,217,432, Cl. 526-119.000.

Sumitomo Electric Industries, Ltd.: *See*—
Takata, Koji, 4,217,005, Cl. 303-24.00F.

Sumitomo, Hiroyuki, to Hisaka Works, Ltd. Plate type evaporator. 4,216,825, Cl. 165-109.00R.

Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See*—
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,217,548, Cl. 324-220.000.

Sundstrand Corporation: *See*—
Reynolds, Richard W., 4,217,120, Cl. 55-385.00R.

Sunworks, Inc.: *See*—
Clark, Peter D., 4,216,764, Cl. 126-448.000.

Suter, Edwin, to Sybron Corporation. Dental cabinet appliance. 4,217,009, Cl. 312-209.000.

Suzue, Akihiro: *See*—
Yoshida, Makoto; Nagashima, Nobutsugu; Suzue, Akihiro; Kitagawa, Ryuichi; and Namikawa, Misao, 4,217,018, Cl. 339-21.00R.

Suzuki, Kenichi: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; Bando, Yasuo; and Hisayuki, Terumi, 4,217,309, Cl. 568-477.000.

Suzuki, Tadao, to Ajinomoto Company, Incorporated. Dried lactic acid bacteria composition. 4,217,419, Cl. 435-253.000.

Suzuki, Toru: *See*—
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.

Suzuki, Tsutomu, to Pioneer Electronic Corporation. Tape measurement and position system. 4,217,615, Cl. 360-137.000.

Suzuki, Yasoji; and Shiraki, Ryuzo, to Tokyo Shibaura Denki Kabushiki Kaisha. Converter producing three output states. 4,217,502, Cl. 307-205.000.

Suzuki, Yasoji; Hitotsuyanagi, Takeshi; and Iida, Tetsuya, to Tokyo Shibaura Electric Co., Ltd. Constant-voltage circuit with a diode and MOS transistors operating in the saturation region. 4,217,535, Cl. 320-48.000.

Suzuki, Yutaka: *See*—
Kobayashi, Kazuo; Yuki, Kiyohiro; and Suzuki, Yutaka, 4,217,467, Cl. 178-67.100.

Svelto, Francesco: *See*—
Fiorito, Giancarlo; Gasparrini, Guido; and Svelto, Francesco, 4,217,490, Cl. 250-211.00J.

Swearingen, Saxon B., to National Distillers and Chemical Corporation. Fast responsive, high pressure thermocouple. 4,217,463, Cl. 136-232.000.

Swift, Harold E.: *See*—
Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., 4,217,287, Cl. 260-348.290.

Swiss Aluminium Ltd.: *See*—
Borer, Werner J.; Nobbe, Volker; and Spalinger, Hugo, 4,217,479, Cl. 219-121.00P.
Meier, Hans-Anton, 4,216,817, Cl. 164-147.000.

Switlik, Richard, Jr. Life raft having a toroidal water ballast chamber. 4,216,559, Cl. 9-11.00R.

Sybron Corporation: *See*—
Suter, Edwin, 4,217,009, Cl. 312-209.000.

Syntex (U.S.A.) Inc.: *See*—
Pfister, Jurg R., 4,217,361, Cl. 424-283.000.

Synthetic Surfaces, Inc.: *See*—
Legue, Norris R., 4,217,254, Cl. 260-3.300.

Syverson, Leonard M., to Wheelabrator-Frye Inc. Filter bag support for multiple bag filters. 4,217,117, Cl. 55-304.000.

Szabat, John F.; Baumann, Gert F.; and Copeland, Gaeta L., to Mobay Chemical Corporation. Catalyst system for polyurethane foams. 4,217,247, Cl. 252-431.00C.

Szmuszkovicz, Jacob, to Upjohn Company, The. Anilide derivatives as antidepressants. 4,217,362, Cl. 424-309.000.

T.E.S., Inc.: *See*—
Rodgers, Steven S., 4,216,660, Cl. 62-238.000.

Tackett, Melvin G. Pop-up cover for motor vehicle. 4,216,989, Cl. 296-136.000.

Tago, Koichi: *See*—
Matsumoto, Shigeo; Tago, Koichi; and Kato, Hidetoshi, 4,217,015, Cl. 316-30.000.

Tajima, Akira: *See*—
Sato, Yasuhisa; Tajima, Akira; and Ono, Yukiharu, 4,217,050, Cl. 354-225.000.

Takada, Shigetaka: *See*—
Inoue, Tokuta; Masui, Takatoshi; Mitsuyasu, Masaki; Takada, Shigetaka; and Okamura, Masayuki, 4,216,753, Cl. 123-445.000.

Takahasai, Soya: *See*—
Hara, Yoshiaki; Mori, Shigeo; Murakami, Fumikazu; Horikoshi, Ichiro; and Takahasai, Soya, 4,216,650, Cl. 368-72.000.

Takahashi, Masaaki: *See*—
Saito, Yukio; Sekiya, Koichi; and Takahashi, Masaaki, 4,217,107, Cl. 23-230.00B.

Takamatsu, Takehiko; Toyomura, Akihiro; and Hashimoto, Masami, to Kabushiki Kaisha Komatsu Seisakusho. Double-drum winch. 4,216,942, Cl. 254-310.000.

Takamizawa, Kinya: *See—*
Iinuma, Kazuhiro; Takamizawa, Kinya; and Ogura, Ichiro, 4,217,516, Cl. 310-335.000.
Takasawa, Yoshio: *See—*
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.
Takata, Koji, to Sumitomo Electric Industries, Ltd. Deceleration responsive load responsive brake pressure control device. 4,217,005, Cl. 303-24.00F.
Takebayashi, Yoshiaki: *See—*
Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,217,349, Cl. 424-248.400.
Takeda, Misturu: *See—*
Inoue, Eiichi; and Takeda, Misturu, 4,217,409, Cl. 430-346.000.
Takekoshi, Tohru: *See—*
Markezich, Ronald L.; and Takekoshi, Tohru, 4,217,281, Cl. 260-326.00A.
Takenaka, Hiroshi, to Nippon Kogaku K.K. Stereoscopic microscope. 4,217,025, Cl. 350-33.000.
Takenaka, Toichi: *See—*
Imai, Kazuo; Niigata, Kunihiro; Fujikura, Takashi; Hashimoto, Shinichi; and Takenaka, Toichi, 4,217,305, Cl. 260-556.0AR.
Takeuchi, Hiroshi, to Olympic Fishing Tackles Company, Limited. Fishing reel seat. 4,216,603, Cl. 43-22.000.
Tamai, Yasuo: *See—*
Aonuma, Masashi; and Tamai, Yasuo, 4,217,152, Cl. 148-108.000.
Tambara, Nobuhiko; Hasegawa, Katsumi; and Yasuda, Toshio, to Toray Industries, Inc. Turret type yarn winding apparatus. 4,216,920, Cl. 242-18.00A.
Tamoto, Katsumi: *See—*
Katsube, Junki; Kobayashi, Tsuyoshi; Tamoto, Katsumi; Takebayashi, Yoshiaki; Sasajima, Kikuo; Inaba, Shigeho; and Yamamoto, Hisao, 4,217,349, Cl. 424-248.400.
Tanaka, Hitoshi: *See—*
Furukawa, Yasuyuki; Fujii, Yoshihisa; Tanaka, Hitoshi; and Hirota, Tetsuya, 4,217,548, Cl. 324-220.000.
Tanaka, Koichi; Kobayashi, Kenji; and Aonuma, Shigeo, to Fuji Xerox Co. Ltd. Cross-linking reaction during melt kneading produces resinous electrophotographic toner. 4,217,406, Cl. 430-137.000.
Tanaka, Koji: *See—*
Okuyama, Yasuhiko; Tanaka, Koji; Nakayama, Yoshiro; and Kato, Hiroshi, 4,216,692, Cl. 84-1.010.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Tanaka, Taro; and Uejima, Norikatsu, 4,216,747, Cl. 123-51.0BA.
Tanaka, Toshimi: *See—*
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, 4,217,131, Cl. 71-108.000.
Tanaka, Yoshiaki: *See—*
Inami, Mamoru; and Tanaka, Yoshiaki, 4,217,578, Cl. 340-754.000.
Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Tanaka, Taro; and Uejima, Norikatsu, 4,216,747, Cl. 123-51.0BA.
Tani, Tatsuo; and Kono, Masao, to Ricoh Company, Ltd. Method for effecting registration for a copying apparatus. 4,217,052, Cl. 355-8.000.
Tanny, Gerald B.: *See—*
Kedem, Ora; Kedem, Abraham; Lev, Menashe; Tanny, Gerald B.; and Messalem, Rami, 4,217,200, Cl. 204-301.000.
Tasaki, Takaharu; Iizuka, Shigeo; and Saito, Tadao, to Yoshino Kogyosho Co., Ltd. Construction for supporting atomizing means of manually operable atomizer. 4,216,883, Cl. 222-321.000.
Tashman, Philip; and Onori, Vito M. Circular food service conveyor. 4,216,845, Cl. 186-49.000.
Tawfik, David A.; Doniger, Jerry; and Porawski, Donald J., to Bendix Corporation, The. Digital flight guidance system. 4,217,486, Cl. 371-68.000.
Taylor, Forrest C.: *See—*
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,216,972, Cl. 277-39.000.
Taylor, John W. Pail opener. 4,216,685, Cl. 81-3.46A.
Taylor, Thomas S.: *See—*
Meece, Kermit A.; and Taylor, Thomas S., 4,217,594, Cl. 346-75.000.
Technicon Instruments Corporation: *See—*
Barabino, Raymond C.; and Keyes, Melvin H., 4,217,415, Cl. 435-98.000.
Technitrol, Inc.: *See—*
McInerny, George P., 4,216,952, Cl. 271-10.000.
Tecumseh Products Company: *See—*
Farr, James B., 4,217,526, Cl. 318-139.000.
Teijin Ltd.: *See—*
Ono, Takezo, 4,217,188, Cl. 204-109.000.
Tektronix, Inc.: *See—*
Holmes, Robert E., 4,217,570, Cl. 338-308.000.
Jurgensen, David J.; and Landsman, Howard A., 4,217,610, Cl. 358-139.000.
Sato, Shuichi; Yamaguchi, Tadanori; and Ritchie, Arthur D., 4,217,599, Cl. 357-23.000.
Teledyne Industries, Inc.: *See—*
Ramsey, Vernon B.; and Wilkes, Thomas J., 4,216,694, Cl. 84-23.000.
Telex Computer Products, Inc.: *See—*
Winebarger, Joseph P., 4,217,553, Cl. 328-164.000.
Tennessee Valley Authority: *See—*
Stinson, John M.; Mann, Horace C., Jr.; and McCullough, John F., 4,217,128, Cl. 71-29.000.
Teranishi, Masayuki: *See—*
Tsuruta, Teruyuki; Kawai, Masanobu; Matsukuma, Ikuo; Teranishi, Masayuki; and Nakamizo, Nobuhiro, 4,217,130, Cl. 71-95.000.
Terashima, Shiro: *See—*
Yamada, Shun-ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, 4,217,284, Cl. 260-343.30P.
Terawaki, Susumu: *See—*
Mizuno, Hideaki; and Terawaki, Susumu, 4,217,151, Cl. 148-31.550.
Tetra Pak International AB: *See—*
Ljungberg, Per-Allan; and Nilsson, Lennart, 4,217,085, Cl. 425-335.000.
Texaco Development Corporation: *See—*
Hunter, Walter D., 4,217,230, Cl. 252-8.55D.
Texacone Company, The: *See—*
Wheeler, John H., 4,216,846, Cl. 187-1.00R.
Texas Instruments Incorporated: *See—*
Ty, Henry, 4,217,398, Cl. 428-616.000.
Textile Rubber & Chemical Company, Inc.: *See—*
Patterson, Henry G.; Shemchek, Stanley A.; Doone, Robert G.; and Christopher, Henry B., 4,217,383, Cl. 428-95.000.
Textron, Inc.: *See—*
Cobb, Clyde E.; and Coakley, Kim L., 4,216,795, Cl. 137-554.000.
Th. Goldschmidt AG: *See—*
Koerner, Gotz; and Rott, Hans, 4,217,228, Cl. 252-8.600.
Theriault, Julius E.: *See—*
Bindle, Edward A.; Theriault, Julius E.; and Toll, Wesley J., 4,217,626, Cl. 362-67.000.
Thermit Welding GB Limited: *See—*
Ashton, Michael E.; and Key, Anthony J., 4,216,816, Cl. 164-54.000.
Thimmesch, David M.: *See—*
Bourke, Robert F.; and Thimmesch, David M., 4,217,527, Cl. 318-139.000.
Bourke, Robert F.; and Thimmesch, David M., 4,217,529, Cl. 318-351.000.
Thir, Basil: *See—*
Newkirk, David D.; Login, Robert B.; and Thir, Basil, 4,217,394, Cl. 428-457.000.
Thomas A. Schutz Co., Inc.: *See—*
Eckert, Ronald P., 4,216,599, Cl. 40-451.000.
Thomas, James R.: *See—*
Howerton, Anderson W.; Klein, Darrell L.; and Thomas, James R., 4,216,679, Cl. 474-238.000.
Thomas, Walter C.: *See—*
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Thomas, Wayne W.; and Thomas, Walter C., to Lady Bea Enterprises, Inc. Method and apparatus for generating and processing television signals for viewing in three dimensions. 4,217,602, Cl. 358-3.000.
Thompson, Johnnie W. Hip joint mechanism. 4,216,550, Cl. 3-15.000.
Thomson-CSF: *See—*
Autran, Jean-Michel, 4,217,564, Cl. 333-152.000.
d'Auria, Luigi; de Crenoux, Baudoin; and Jacques, Andre, 4,217,598, Cl. 357-19.000.
Hirtz, Pierre, 4,217,597, Cl. 357-19.000.
Thoratec Laboratories Corporation: *See—*
Downie, David E.; Harvey, Robert J.; and Rueff, John R., 4,216,776, Cl. 128-305.000.
Thornton, Charles B. Device for inserting elastomeric separation rings between teeth. 4,217,099, Cl. 433-148.000.
Thurm, Siegfried; and Bunge, Konrad, to AGFA-Gevaert, A.G. Method and apparatus for evaluating color photographic negatives prior to copying. 4,217,648, Cl. 364-526.000.
Tibolla, Julius F., to GTE Sylvania Wiring Devices Incorporated. Transient voltage surge suppressing device. 4,217,619, Cl. 361-56.000.
Tiger, Jessie C.: *See—*
Harless, Clarence E.; and Tiger, Jessie C., 4,216,931, Cl. 248-89.000.
Timex Corporation: *See—*
Wilson, Robert, 4,216,818, Cl. 164-443.000.
Timofeev, Valery A.: *See—*
Kosyrev, Felix K.; Timofeev, Valery A.; Pekh, Anatoly K.; and Leonov, Alexandr P., 4,217,560, Cl. 331-94.50D.
Titchmarsh, James G., to International Standard Electric Corporation. Double crucible method of optical fiber manufacture. 4,217,123, Cl. 65-3.00A.
Titovi Zavodi Litostroj Ljubljana n.sol.o.: *See—*
Brcar, Anton, 4,217,077, Cl. 417-407.000.
Tjufyakov, Andrei S.: *See—*
Dmitrievsky, Anatoly V.; Kamenev, Vladimir F.; Pashin, Jury M.; Prudov, Nikolai M.; Simatov, Alexandr I.; Tjufyakov, Andrei S.; Shishkin, Jury N.; and Yamolov, Jury I., 4,217,313, Cl. 261-41.00D.
TMC Corporation: *See—*
Krob, Erwin, 4,216,976, Cl. 280-605.000.
Tobe, Akihiro: *See—*
Kikumoto, Ryoji; Tobe, Akihiro; Fukami, Harukazu; Ninomiya, Kunihiro; and Egawa, Mitsuo, 4,217,366, Cl. 424-330.000.
Tobert, Jonathan A., to Merck & Co., Inc. Rapid acting combination of phenyl benzoic acid compounds and magnesium hydroxide. 4,217,340, Cl. 424-157.000.

Tojo, Kenji; Kousokabe, Hirokatu; Arai, Nobukatsu; and Sato, Eiji, to Hitachi, Ltd. Scroll compressor with means for end plate bias and cooled gas return to sealed compressor spaces. 4,216,661, Cl. 62-505.000.
Tokitsu, Tetsuya. Reheating furnace for use in a hot rolling line. 4,217,095, Cl. 432-128.000.
Tokizawa, Hiroki: *See—*
Harao, Norio; Tokizawa, Hiroki; and Nishikawa, Teruhide, 4,217,518, Cl. 313-398.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
Shikata, Kazuo; and Shigemune, Toshiaki, 4,217,298, Cl. 260-463.000.
Tokyo Institute of Technology: *See—*
Mori, Yasuo; and Hijikata, Kunio, 4,217,172, Cl. 176-9.000.
Tokyo Sanyo Electric Co., Ltd.: *See—*
Sawazaki, Tamaki, 4,217,149, Cl. 148-1.500.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Aoki, Kazuhide; Kawagai, Kenji; Nagae, Akira; and Goto, Shuichi, 4,217,505, Cl. 307-273.000.
Suzuki, Yasoji; and Shiraki, Ryuzo, 4,217,502, Cl. 307-205.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Hamano, Eizaburo; Okada, Hisafumi; and Yamazaki, Hidetoshi, 4,217,566, Cl. 335-212.000.
Harao, Norio; Tokizawa, Hiroki; and Nishikawa, Teruhide, 4,217,518, Cl. 313-398.000.
Iinuma, Kazuhiro; Takamizawa, Kinya; and Ogura, Ichiro, 4,217,516, Cl. 310-335.000.
Namimoto, Keiji; Eguchi, Seiji; and Murao, Yutaka, 4,217,638, Cl. 364-200.000.
Suzuki, Yasoji; Hitotsuyanagi, Takeshi; and Iida, Tetsuya, 4,217,535, Cl. 320-48.000.
Tolbert, William R.; Feder, Joseph; Kuo, Mau-Jung; and Folkman, Moses J., to President and Fellows of Harvard College. Production of tumor angiogenesis factor by cell culture. 4,217,412, Cl. 435-68.000.
Toll, Wesley J.: *See—*
Bindle, Edward A.; Theriault, Julius E.; and Toll, Wesley J., 4,217,626, Cl. 362-67.000.
Tomita, Kazumi; and Fujiike, Yoshitaka. Movable car headlights. 4,217,627, Cl. 362-71.000.
Tomita, Sadami: *See—*
Chiba, Akio; Imahashi, Hiromichi; Tomita, Sadami; and Utsumi, Yoshiharu, 4,217,568, Cl. 335-298.000.
Tompsett, Michael F.: *See—*
Smith, George E.; and Tompsett, Michael F., 4,217,600, Cl. 357-24.000.
Toms River Chemical Company: *See—*
Stingl, Hans A., 4,217,102, Cl. 8-662.000.
Toratani, Hisayoshi, to Hoya Corporation. Edge-cladding glass of disc laser glass. 4,217,382, Cl. 428-66.000.
Toray Industries, Inc.: *See—*
Tambara, Nobuhiko; Hasegawa, Katsumi; and Yasuda, Toshio, 4,216,920, Cl. 242-18.00A.
Torisu, Kiwa. Weld assembled tank. 4,216,874, Cl. 220-5.00A.
Toth, Maria; and Reker, Frederick A., to General Signal Corporation. Cam member for actuating and/or restraining the motion of a bail. 4,217,474, Cl. 200-335.000.
Totino, Peter J., to Singer Company, The. Sewing machine with universal upper feed. 4,216,734, Cl. 112-320.000.
Toyama, Teruhiko; Morikawa, Osamu; Tanaka, Toshimi; Hojo, Yoshikata; Takasawa, Yoshio; and Kurechi, Taisuke, to Mitsui Toatsu Chemicals, Incorporated. Herbicidal composition. 4,217,131, Cl. 71-108.000.
Toyo Kogyo Co., Ltd.: *See—*
Yoshioka, Sadashichi, 4,216,758, Cl. 123-198.00F.
Toyo Seikan Kaisha Limited: *See—*
Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, 4,217,161, Cl. 156-242.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Baba, Nobuyuki; and Hashimoto, Tsutomu, 4,217,223, Cl. 210-198.00C.
Goto, Takeshi; Kawakami, Noboru; Hirano, Itsuo; and Kawahara, Yuji, 4,217,133, Cl. 75-58.000.
Toyo Syokuhin Kikai Kabushiki Kaisya: *See—*
Yoshida, Toshio, 4,216,638, Cl. 156-466.000.
Toyoda, Takeharu: *See—*
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,216,944, Cl. 266-44.000.
Toyomura, Akihiro: *See—*
Takamatsu, Takehiko; Toyomura, Akihiro; and Hashimoto, Masami, 4,216,942, Cl. 254-310.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kawaguchi, Hiroshi, 4,217,004, Cl. 303-6.00C.
Kizaki, Ziro, 4,216,850, Cl. 188-216.000.
Ogita, Tamotsu, 4,216,749, Cl. 123-408.000.
Ushijima, Fumihiro, 4,216,852, Cl. 192-85.0AA.
Trefz, Walter: *See—*
Kopf, Rudi; and Trefz, Walter, 4,217,118, Cl. 55-330.000.
Treger, Jury A.: *See—*
Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V., 4,217,311, Cl. 260-656.00R.
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Perfume compositions containing 1-acyl-2,6,6-trimethylcyclohexene derivatives. 4,217,252, Cl. 252-522.00R.
Treuner, Uwe D.; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. Cephalosporins having an oxazolidonyloxamido substituted acyl sidechain. 4,217,348, Cl. 424-246.000.
Trevathan, Ellis F. Machine for comminuting clay stock. 4,216,919, Cl. 241-92.000.
Triad & Associates, Inc.: *See—*
Triplett, William C., 4,216,614, Cl. 47-2.000.
Tricoire, Jean: *See—*
Jennen, Friedrich; and Tricoire, Jean, 4,217,373, Cl. 427-2.000.
Trigon, Jean F., to Societe l'Electricfil. Method for making an electric cable with improved takeouts. 4,216,578, Cl. 29-857.000.
Triplett, William C., to Triad & Associates, Inc. Technique for heating an agricultural area. 4,216,614, Cl. 47-2.000.
Troup, Edward M., to Rain Bird Sprinkler Mfg. Corp. Method and apparatus for enhancing the distribution of water from an irrigation sprinkler. 4,216,913, Cl. 239-594.000.
Trp, Peter; Lipovac, Mile; Ribich, Rodolfo J., deceased; and by Ribich, Virginia, legal representative. Paint feeding apparatus in combination with a fountain type paint roller. 4,217,062, Cl. 401-44.000.
TRW Inc.: *See—*
Aprahamian, Robert; and Miller, Joseph, 4,217,558, Cl. 331-94.50C.
Burge, Harland L.; Hardgrove, John A.; and Krieve, Walter F., 4,217,132, Cl. 75-26.000.
Kraus, Willibald, 4,216,637, Cl. 52-718.000.
Trzepaez, Jean: *See—*
Grosch, Karl A.; Mirtain, Henri J.; Devienne, Andre M.; and Trzepaez, Jean, 4,216,814, Cl. 152-362.00R.
Tscherner, Georg W., to Coleco Industries, Inc. Rotary valve. 4,216,798, Cl. 137-625.290.
Tsuchiya, Yoshimi; and Mizutani, Hiroshi, to Kao Soap Co., Ltd. Absorbent article. 4,216,772, Cl. 128-284.000.
Tsuda, Tatsuya: *See—*
Matsubara, Sigeo; and Tsuda, Tatsuya, 4,217,477, Cl. 219-10.55B.
Tsunekawa, Masaru: *See—*
Inada, Masami; Ohumi, Takeharu; and Tsunekawa, Masaru, 4,216,938, Cl. 251-65.000.
Tsuruta, Teruyuki; Kawai, Masanobu; Matsukuma, Ikuo; Teranishi, Masayuki; and Nakamizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. Agents for and method of modifying citrus fruit. 4,217,130, Cl. 71-95.000.
Tuck, Winfree P., to Inteq, Inc. Communications interface adapter. 4,217,624, Cl. 361-394.000.
Tucker, Benjamin W.: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,217,436, Cl. 528-45.000.
Tufts, Lewis E.; and Mentz, Bernardus J., to Hooker Chemicals & Plastics Corp. Operation of electrolytic diaphragm cells utilizing interruptable or off-peak power. 4,217,187, Cl. 204-98.000.
Tupper, Myron D. Apparatus for shredding tire casings. 4,216,916, Cl. 241-36.000.
Tuzson, John J., to Borg-Warner Corporation. Hermetically sealed rotary drive apparatus. 4,216,677, Cl. 74-17.800.
Ty, Henry, to Texas Instruments Incorporated. Thermostat metal. 4,217,398, Cl. 428-616.000.
Ube Industries, Ltd.: *See—*
Kono, Hisashi; Nakai, Shigeyuki; Hisadomi, Masaki; Minemura, Norimichi; Okita, Tetsuo; and Kawamura, Sigeru, 4,217,127, Cl. 71-28.000.
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; Bando, Yasuo; and Hisayuki, Terumi, 4,217,309, Cl. 568-477.000.
Ueda, Hiroshi: *See—*
Yamazaki, Keiji; Egawa, Takeshi; Yamazaki, Yasuo; and Ueda, Hiroshi, 4,217,044, Cl. 354-54.000.
Uede, Hisashi: *See—*
Hamada, Hiroshi; Nakauchi, Hiroshi; Inami, Yasuhiko; and Uede, Hisashi, 4,217,579, Cl. 340-763.000.
Uejima, Norikatsu: *See—*
Noguchi, Masaaki; Tanaka, Yukiyasu; Tanaka, Taro; and Uejima, Norikatsu, 4,216,747, Cl. 123-51.0BA.
Ulbing, Otmar M. Fluidic actuator for a switching device. 4,217,471, Cl. 200-81.90R.
Ulrich, Henri: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,217,436, Cl. 528-45.000.
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; Bando, Yasuo; and Hisayuki, Terumi, to Ube Industries, Ltd. Process for producing methacrolein. 4,217,309, Cl. 568-477.000.
Union Carbide Corporation: *See—*
Kamp, Ewald A., 4,216,899, Cl. 229-54.00R.
Notaro, Frank, 4,216,819, Cl. 165-1.000.
Petty, Herbert E., 4,217,294, Cl. 556-419.000.
Unique Mobility Inc.: *See—*
Gould, John S.; Winquist, Roger D.; Eve, William R., IV; McCutchen, James V.; Pelcher, Anthony M.; and Watson, Richard E., 4,216,839, Cl. 180-65.00R.
Uniroyal GmbH: *See—*
Grosch, Karl A.; Mirtain, Henri J.; Devienne, Andre M.; and Trzepaez, Jean, 4,216,814, Cl. 152-362.00R.
Uniroyal, Inc.: *See—*
Pixley, James J., 4,216,809, Cl. 152-158.000.
United States of America
Air Force: *See—*
Giladett, Leo V., 4,216,723, Cl. 102-223.000.

Radovich, Danilo, 4,217,026, Cl. 350-58.000.
Army: *See—*
Arons, Gilbert N.; and Macnair, Richard N., 4,217,386, Cl. 428-198.000.
Czerwinski, Watson P., 4,217,591, Cl. 343-713.000.
Fishbein, William; and Rittenbach, Otto E., 4,217,585, Cl. 343-7.700.
Marziano, Samuel J.; and Donnard, Reed E., 4,216,721, Cl. 102-90.000.
Energy: *See—*
Lerch, Ronald E.; and Partridge, Jerry A., 4,217,192, Cl. 204-149.000.
Li, James C. M.; and Chu, Sungnee G., 4,217,493, Cl. 250-272.000.
Health, Education and Welfare: *See—*
Daniels, Charles J.; and Silberberg, Jeffrey L., 4,217,496, Cl. 250-369.000.
Daniels, Charles J.; and Silberberg, Jeffrey L., 4,217,497, Cl. 250-369.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Ciszek, Theodore F. Method of growing a ribbon crystal particularly suited for facilitating automated control of ribbon width. 4,217,165, Cl. 156-601.000.
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Evans, John C., Jr., 4,217,633, Cl. 363-27.000.
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Bartoli, Filbert J.; Esterowitz, Leon; Allen, Roger E.; and Kruer, Melvin R., 4,217,547, Cl. 324-158.00R.
Duykers, Ludwig R.; and Percy, Joseph L., 4,216,766, Cl. 128-773.000.
Hooper, John O.; Stone, W. James; and Burklund, Vernon D., 4,216,928, Cl. 244-122.0AD.
Kempton, Marvin L., 4,216,720, Cl. 102-67.000.
Prickett, Michael J., 4,217,581, Cl. 343-7.300.
Rice, Johnnie W.; Gripshover, Ronald J.; Rose, Millard F.; and Van Wagoner, Richard C., 4,217,468, Cl. 178-116.000.
U.S. Philips Corporation: *See—*
Naparstek, Abraham, 4,217,641, Cl. 364-414.000.
Rosier, Jean-Claude, 4,217,489, Cl. 250-207.000.
Van den Brink, Hans G.; Van Hoof, Albertus J. F. M.; Van Kleef, Johannes H. K. C.; and Lamboo, Theodorus F., 4,217,559, Cl. 331-94.50C.
United Technologies Corporation: *See—*
Bourdeau, Romeo G., 4,217,082, Cl. 425-8.000.
Fradenburgh, Evan A., 4,216,924, Cl. 244-17.110.
Neal, James W.; Loersch, Joseph F.; and Adinolfi, Robert G., 4,217,190, Cl. 204-129.350.
Stoltze, Leon; Nutter, Harry A., Jr.; and Wilson, Robert F., 4,217,157, Cl. 156-87.000.
University of Louisville, The: *See—*
Suddick, Richard P.; Staat, Robert H.; and Doyle, Ronald J., 4,217,341, Cl. 424-48.000.
UOP Inc.: *See—*
Ward, Dennis J., 4,217,461, Cl. 585-668.000.
Upjohn Company, The: *See—*
Richter, Reinhard H.; Tucker, Benjamin W.; and Ulrich, Henri, 4,217,436, Cl. 528-45.000.
Szmuszkovicz, Jacob, 4,217,362, Cl. 424-309.000.
Ushijima, Fumihiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic control system for automatic transmissions of motor vehicles. 4,216,852, Cl. 192-85.0AA.
USM Corporation: *See—*
Rooney, John P., 4,217,081, Cl. 425-129.00S.
Utsumi, Yoshiharu: *See—*
Chiba, Akio; Imahashi, Hiromichi; Tomita, Sadami; and Utsumi, Yoshiharu, 4,217,568, Cl. 335-298.000.
Utzmann, Rene; and Dronet, Jean M., to Ste d'Application Plastique, Mecanique et Electronique Plastimecanique S.A. Advancing arrangement with adjustable stepwise advancing distance. 4,217,163, Cl. 156-361.000.
Uzgiris, Egidijus E.; and Bergeron, John A., to General Electric Company. Electrophoretic electrode for use in laser doppler shift spectroscopy, and method. 4,217,195, Cl. 204-195.00F.
Uzuka, Mitsuo, to Sony Corporation. DC motor. 4,217,508, Cl. 310-46.000.
V. Kann Rasmussen Holding A/S: *See—*
Sorensen, Bendt D., 4,216,985, Cl. 292-336.300.
Valdespino, Joseph M. Recreational vehicle leveling and support system. 4,216,939, Cl. 254-45.000.
Vale, Christopher R., to Westinghouse Electric Corp. Surface wave phase correlator and monopulse radar system employing the same. 4,217,563, Cl. 333-150.000.
Valintine, Lyle D.: *See—*
Musgrove, Donovon E.; Vos, Wilbur D.; and Valintine, Lyle D., 4,216,990, Cl. 296-213.000.
Van Beek, Dirk A. Device for charging accumulators. 4,217,533, Cl. 320-23.000.
Van den Brink, Hans G.; Van Hoof, Albertus J. F. M.; Van Kleef, Johannes H. K. C.; and Lamboo, Theodorus F., to U.S. Philips Corporation. Method of adjusting gas laser mirror. 4,217,559, Cl. 331-94.50C.
Van Hoof, Albertus J. F. M.: *See—*
Van den Brink, Hans G.; Van Hoof, Albertus J. F. M.; Van Kleef, Johannes H. K. C.; and Lamboo, Theodorus F., 4,217,559, Cl. 331-94.50C.
Van Kleef, Johannes H. K. C.: *See—*
Van den Brink, Hans G.; Van Hoof, Albertus J. F. M.; Van Kleef, Johannes H. K. C.; and Lamboo, Theodorus F., 4,217,559, Cl. 331-94.50C.
Vanlerberghe, Guy; and Handjani, Rose-Marie, to L'Oreal. Compositions containing aqueous dispersions of lipid spheres. 4,217,344, Cl. 424-60.000.
Van Slooten, Kevin D. Hair cutting appliance. 4,216,581, Cl. 30-133.000.
Van Wagoner, Richard C.: *See—*
Rice, Johnnie W.; Gripshover, Ronald J.; Rose, Millard F.; and Van Wagoner, Richard C., 4,217,468, Cl. 178-116.000.
Varady, Joseph S.; and Knights, Robert C., to Hafotu Pty. Limited. Paper feeding device. 4,216,953, Cl. 271-11.000.
Venere, Lawrence A.: *See—*
Domes, E. A.; Taylor, Forrest C.; and Venere, Lawrence A., 4,216,972, Cl. 277-39.000.
Ventive AB: *See—*
Wallenius, Jan F., 4,216,739, Cl. 118-216.000.
Verschuur, Eke; and Masdin, Edward G., to Shell Oil Company. Process for preparing a suspension of particles in a hydrocarbon oil. 4,217,110, Cl. 44-51.000.
Verzwyvelt, Scott A., to Hughes Aircraft Company. Polypropylene separator for use in alkaline storage batteries and process for making same. 4,217,404, Cl. 429-206.000.
Vessely, James F.: *See—*
Jacksen, Peter J.; Kuklin, Arlen J.; Jacksen, Peter R.; and Vessely, James F., 4,217,047, Cl. 354-77.000.
Victor Company of Japan, Limited: *See—*
Inami, Mamoru; and Tanaka, Yoshiaki, 4,217,578, Cl. 340-754.000.
Mizuno, Hideaki; and Terawaki, Susumu, 4,217,151, Cl. 148-31.550.
Vida, Julius A.; and Kerridge, Kenneth A., to Bristol-Myers Company. Methoxyethoxymethyl esters of penicillins. 4,217,274, Cl. 260-239.100.
Vidonne, Louis: *See—*
Hugel, Philippe; Kraess, Henri; Louis, Remi; and Vidonne, Louis, 4,217,503, Cl. 307-237.000.
Viezee, Dirk J.; Mekkelholt, Petrus J. M.; and Juijn, Johannes A., to Akzona Incorporated. Process for the manufacture of a non-woven web from synthetic filaments. 4,217,387, Cl. 428-288.000.
Vinals, Joaquin: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.
Vinals, Joaquin F.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,217,371, Cl. 426-538.000.
Vivion, Robert. Device for fastening a railway track on sleepers disposed end to end. 4,216,904, Cl. 238-25.000.
Vock, Manfred H.: *See—*
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,217,371, Cl. 426-538.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,217,252, Cl. 252-522.00R.
Vockenhuber, Karl: *See—*
Gobl, Irmgard, 4,217,033, Cl. 350-184.000.
Vogel, Alan D.; and Snyder, Fred E., to Electro-Therm, Inc. Terminal block for single phase or three phase wiring of an immersion heater assembly and methods of wiring. 4,217,483, Cl. 219-541.000.
Vogel, Eberhard: *See—*
Paule, Kurt; and Vogel, Eberhard, 4,216,582, Cl. 30-216.000.
Volgstadt, Frank R.; Reschke, Albert H.; Passerell, David P.; and Day, Raymond A., to Perfection Corporation. Shutoff valve. 4,216,793, Cl. 137-318.000.
Volk, Anthony J.; and Groh, Robert, to Volk, Anthony J. Meat stripping machine for fowl. 4,216,565, Cl. 17-1.00G.
Vollmer, Regis R.: *See—*
Stiller, Richard L.; Shaffer, Robert; Smith, Edward H.; and Vollmer, Regis R., 4,216,569, Cl. 29-157.30C.
Von, Isaiah, to American Cyanamid Company. Process for azo pigments. 4,217,273, Cl. 260-202.000.
Vong, Sandy T. S., to Ford Motor Company. Coated glass article. 4,217,392, Cl. 428-432.000.
von Gutfeld, Robert J.: *See—*
Melcher, Robert L.; and von Gutfeld, Robert J., 4,217,183, Cl. 204-15.000.
Von Praun, Ferdinand: *See—*
Schneider, Wolfgang; Von Praun, Ferdinand; and Niehaves, Kurt, 4,217,106, Cl. 8-127.000.
Vorbrueggen, Helmut; Schwarz, Norbert; Loge, Olaf; and Elger, Walter, to Schering Aktiengesellschaft. Novel 1,3-benzodioxaneprostanoic acid derivatives and process for the preparation thereof. 4,217,360, Cl. 424-278.000.
Vos, Wilbur D.: *See—*
Musgrove, Donovon E.; Vos, Wilbur D.; and Valintine, Lyle D., 4,216,990, Cl. 296-213.000.
W. H. Brady Co.: *See—*
Parkinson, Wayne K., 4,217,473, Cl. 200-159.00B.
W. Haking Enterprises Ltd.: *See—*
Yan, Chan K., 4,217,042, Cl. 354-21.000.
Wachter, Peter: *See—*
Hengartner, Alex; Wachter, Peter; and Baumann, Kurt, 4,216,915, Cl. 239-698.000.

Wada, Shoji. Device for automatically grinding syringe needle point. 4,216,628, Cl. 51-98.500.

Wade, David C.: *See—*
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Wahl, James A.: *See—*
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Waldhuter, Werner; and Lichtinghagen, Klaus, to Glacier GmbH - DEVA Werke. Method and apparatus for extrusion pressing of a granulated, preferably powder-metallurgic material. 4,217,140, Cl. 75-214.000.

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Wall, Arne E.: *See—*
Siwersson, Olle L.; Wall, Arne E.; and Loodberg, Jan A. T., 4,217,109, Cl. 44-1.0SR.

Wallenius, Jan F., to Ventive AB. Painting machine. 4,216,739, Cl. 118-216.000.

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Walter, John L.: *See—*
Luborsky, Fred E.; and Walter, John L., 4,217,135, Cl. 75-123.00L.

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Warnke, Hans, to Klockner-Werke AG. Pressure operated coupler. 4,216,876, Cl. 220-319.000.

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Watanabe, Masaru; Yoyama, Tadao; and Ohashi, Azusa, to Fuji Photo Film Co., Ltd. Light-sensitive O-quinone diazide containing copying material. 4,217,407, Cl. 430-166.000.

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Davis, Stephen H., 4,217,011, Cl. 312-237.000.

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Watson, Richard E.: *See—*
Gould, John S.; Winquist, Roger D.; Eve, William R., IV; McCutchen, James V.; Pelcher, Anthony M.; and Watson, Richard E., 4,216,839, Cl. 180-65.00R.

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Henry, Donald E.; Murrell, Thomas A.; Schilt, Marvin H.; and Weaver, Alfred C., 4,217,658, Cl. 364-900.000.

Weaver, Harry R.: *See—*
Ammon, J. Preston; and Weaver, Harry R., 4,216,576, Cl. 29-845.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Friedl, Reiner; Zeus, Dieter; Widemann, Friedrich; and Hornfeck, Werner, 4,216,759, Cl. 126-110.00B.

Webb, Austin A.: *See—*
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Webb, William M., to General Electric Company. Adjustable volume-split refrigerator. 4,217,010, Cl. 312-214.000.

Weber, Karl-Heinz: *See—*
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Weder, Donald E.: *See—*
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McConnell, Richard L.; and Weemes, Doyle A., 4,217,435, Cl. 525-425.000.

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Hauler, Peter; Bremer, Wolfgang; Weiss, Karl-Ernst; and Heintz, Frieder, 4,217,512, Cl. 310-155.000.

Weiss, Robert L., to Reading Body Works, Inc. Vehicle body having pivotable side walls. 4,216,988, Cl. 296-43.000.

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Weman, Per O., to N.V. Klippan S.A. Device for reducing spring tension in a belt strap. 4,216,922, Cl. 242-107.000.

Wentzler, Thomas H., to Dow Chemical Company, The. Method for separating solid lubricating material from drill cuttings. 4,217,208, Cl. 209-18.000.

West Electric Co., Ltd.: *See—*
Hirata, Shinji, 4,217,523, Cl. 315-241.00P.

Western Electric Company, Inc.: *See—*
Chisholm, William M., 4,216,580, Cl. 29-842.000.

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Anderson, Larry W.; and Sahasrabudhe, Arun P., 4,217,643, Cl. 364-426.000.
Glatthorn, Raymond H., 4,216,893, Cl. 228-45.000.
Jacomini, Omar J., 4,217,587, Cl. 343-100.0SA.
King, Edward I., Jr.; and Reed, Brian J., 4,217,511, Cl. 310-55.000.
Long, Lawrence J.; and Albaric, Jacques E., 4,217,515, Cl. 310-270.000.
Stiller, Richard L.; Shaffer, Robert; Smith, Edward H.; and Vollmer, Regis R., 4,216,569, Cl. 29-157.30C.
Vale, Christopher R., 4,217,563, Cl. 333-150.000.

Westphal, Teddy M., to Boise Cascade Corporation. Method and apparatus for forming no-fin scored metal ends. 4,216,736, Cl. 113-121.00C.

Westrom, Stanley J. Shear sharpener. 4,216,627, Cl. 51-69.000.

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Ryan, A. Sensor, 4,216,773, Cl. 128-284.000.

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Wheeler, John H., to Texacone Company, The. Elevator rail cleaning system. 4,216,846, Cl. 187-1.00R.

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White, Ronald E.: *See—*
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Erickson, Erick E.; Wildman, John R.; Meyer, Burton C.; and Burck, Joseph M., 4,216,612, Cl. 46-103.000.

Wilkes, Thomas J.: *See*—
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Williams, Fred G., Jr.: *See*—
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Wilson, Leroy. Two-piece reusable fastener. 4,216,697, Cl. 85-70.000.

Wilson, Robert, to Timex Corporation. Continuous casting mold assembly. 4,216,818, Cl. 164-443.000.

Wilson, Robert F.: *See*—
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Windmoller & Holscher: *See*—
Achelpohl, Fritz; and Mundus, Friedhelm, 4,216,705, Cl. 93-33.00H.

Windom, Kenneth R. Electrical lighting system for rotating chair. 4,217,628, Cl. 362-75.000.

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Winfield Agri-Builders Company: *See*—
O'Hanlon, Dudley J., 4,216,914, Cl. 239-666.000.

Winquist, Roger D.: *See*—
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Witek, Stanislaw; Grobelny, Damian; Ptaszkowska, Janina; Bielecki, Andrzej; Bakuniak, Edmund; Fulde, Stefan; and Gorska-Poczopko, Jadwiga. Fungicidal quaternary ammonium composition. 4,217,365, Cl. 424-329.000.

Witzel, Frank; Mackay, Donald A. M.; Bakal, Abraham I.; and Clark, K. Warren, to Life Savers, Inc. Long-lasting chewing gum and method. 4,217,368, Cl. 426-5.000.

Wolf, Gerhard D.: *See*—
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Wolf, Karlheinz; Molls, Hans-Heinz; Nebeling, Reinhard; Petroll, Hans-Werner; Hornle, Reinhold; Schwaebel, Richard; and Kaspar, Vaclav, to Bayer Aktiengesellschaft. Dyestuff formulations containing salts of diaryl ether sulfonic acids. 4,217,103, Cl. 8-66.000.

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Wozniak, Stephen G., to Apple Computer, Inc. Apparatus for digitally controlling pal color display. 4,217,604, Cl. 358-16.000.

Wreford-Howard, David. Lamp operability testing device for playing machine. 4,217,576, Cl. 340-642.000.

Wright, David M.; O'Toole, Jerome; and Hedstrom, Norman A., to Wright Line Inc. Document storage system. 4,217,008, Cl. 312-184.000.

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Wright, Richard V.; and Carter, Robert E., to Rogers Corporation. Open end spinning rotor. 4,216,644, Cl. 57-58.890.

Wright, Ronnie G., to High Tech, Inc. Smoking device. 4,216,786, Cl. 131-180.000.

Wu, Ching-Yong; Swift, Harold E.; and Bozik, John E., to Gulf Research & Development Company. Epoxidation of alpha-olefins. 4,217,287, Cl. 260-348.290.

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Wu, Hsiao, to Extruded Metals. Method of relieving stress in extruded sections. 4,216,666, Cl. 72-256.000.

Wurlitzer Company, The: *See*—
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WWG Industries, Inc.: *See*—
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Wyatt, John G.; and Parker, Kenneth R., to Lodge-Cottrell Limited. Fume containment. 4,216,708, Cl. 98-36.000.

Wyden, Stephen. Method of forming conoid surfaces. 4,217,124, Cl. 65-71.000.

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Yamada, Masashi: *See*—
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Yamada, Muneki; Hirata, Sadao; Yazaki, Jinichi; Maruhashi, Yoshitsugu; Sakano, Kozaburo; Kishimoto, Akira; Hirata, Shunsaku; Suzuki, Toru; and Kano, Fumio, to Toyo Seikan Kaisha Limited. Process for making a container. 4,217,161, Cl. 156-242.000.

Yamada, Seiichi; Kamehara, Nobuo; and Murakawa, Kyohei, to Fujitsu Limited. Process for manufacturing an alumina substrate by acid purifying a prefired substrate before final firing. 4,217,337, Cl. 423-626.000.

Yamada, Shun-ichi; Terashima, Shiro; Nagakura, Masahiko; and Nara, Munehiko, to Kowa Company Ltd. Process for preparation of optically pure lactones from monoesters of cis-cyclopentenediol. 4,217,284, Cl. 260-343.30P.

Yamada, Takashi: *See*—
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Yamaguchi, Fumiaki: *See*—
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Yamaguchi, Motoo: *See*—
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Yamamura, Yukio; Ichinomiya, Tsutomu; and Ishimaru, Shinichi, to Matsushita Electric Works, Ltd. Running machine. 4,216,956, Cl. 272-70.000.

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Yamazaki, Keiji; Egawa, Takeshi; Yamazaki, Yasuo; and Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha. Indicating devices for camera viewfinders. 4,217,044, Cl. 354-54.000.

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Yan, Chan K., to W. Haking Enterprises Ltd. Camera for different speed films. 4,217,042, Cl. 354-21.000.

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Yasuda, Naohiko; Eguchi, Chikahiko; Okutsu, Masaru; and Hirose, Yoshiteru, to Ajinomoto Company, Incorporated. Imidazoledicarboxylic acid substituted cephalosporin derivatives. 4,217,450, Cl. 544-25.000.

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Yazawa, Fumihiko, to Singer Company, The. Automatic buttonhole stitch proportioning device for sewing machines. 4,216,731, Cl. 112-158.00B.

Yeda Research & Development Co. Ltd.: *See*—
Kedem, Ora; Kedem, Abraham; Lev, Menashe; Tanny, Gerald B.; and Messalem, Rami, 4,217,200, Cl. 204-301.000.

Yeeda, David. Self-scoring multiple function dart game. 4,216,968, Cl. 273-376.000.

Yevick, George J., to IZON Corporation. Cassegrainian microfiche lens construction. 4,217,041, Cl. 353-120.000.

Yokono, Yoshinobu: *See*—
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Yonan, Peter K., to G. D. Searle & Co. α-Aryl-α,α-bis[ω-(disubstituted amino)alkyl]-acetamides. 4,217,306, Cl. 260-557.00R.

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Yoshida Kogyo KK: *See*—
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Yoshida, Makoto; Nagashima, Nobutsugu; Suzue, Akihiro; Kitagawa, Ryuichi; and Namikawa, Misao, to Matsushita Electric Works, Ltd. Electrical supply track. 4,217,018, Cl. 339-21.00R.

Yoshida, Toshio, to Toyo Syokuhin Kikai Kabushiki Kaisya. Wrapping machine. 4,216,638, Cl. 156-466.000.

Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshino, Youziro; and Kondo, Kazuko, to Nisshin Flour Milling Co., Ltd. Process for the preparation of Dl-α-tocopherol of high purity. 4,217,285, Cl. 260-345.500.

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Yoshioka, Sadashichi, to Toyo Kogyo Co., Ltd. Automobile fuel intake system. 4,216,758, Cl. 123-198.00F.

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Young, Edward: *See*—
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Youngers, Stephen A.; and Neufeld, Sidney B., to J. I. Case Company. Universal digging boom. 4,217,001, Cl. 299-82.000.

Yoyama, Tadao: *See*—
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Yoyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Yuasa Battery Company Limited: *See*—
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Yuki, Kiyohiro: *See*—
Kobayashi, Kazuo; Yuki, Kiyohiro; and Suzuki, Yutaka, 4,217,467, Cl. 178-67.100.

Zacher, Wieland; Pfleger, Klaus; Boettcher, Klaus; Skorczyk, Ronald; and Buechner, Oskar, to BASF Aktiengesellschaft. Manufacture of ethylene copolymers. 4,217,431, Cl. 526-68.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Hamma, Karlmann, 4,216,656, Cl. 60-445.000.

Zaidman, Oleg A.; Sonin, Erik V.; Sevostianova, Ljudmila B.; Melnik, Alla N.; Treger, Jury A.; Paschenko, Larisa E.; Oshin, Leonid A.; and Polozov, Oleg V. Method of preparing vinyl chloride. 4,217,311, Cl. 260-656.00R.

Zanzucchi, Peter J.: *See*—
Staebler, David L.; and Zanzucchi, Peter J., 4,217,393, Cl. 428-450.000.

Zardi, Umberto: *See*—
Lagana', Vincenzo; and Zardi, Umberto, 4,217,114, Cl. 55-70.000.

Zarges Leichtbau GmbH: *See*—
Klafs, Ulrich, 4,216,844, Cl. 182-104.000.

Zellner, John R.; Lehto, Eino M.; and Polinsky, Michael V., to Bell & Howell Company. Microfiche viewer with rotatable base. 4,217,039, Cl. 353-27.00R.

Zenith Radio Corporation: *See*—
Dietch, Leonard; and Schwartz, James W., 4,217,521, Cl. 313-479.000.
Sugarman, Meyer L., 4,217,520, Cl. 313-472.000.

Zeus, Dieter: *See*—
Friedl, Reiner; Zeus, Dieter; Widemann, Friedrich; and Hornfeck, Werner, 4,216,759, Cl. 126-110.00B.

Ziemacki, Michael S., to Wolff Controls Corporation. Regulated permanent magnet D.C. power supply. 4,217,538, Cl. 322-29.000.

Ziemba, Georg. Facility for generating technically useable energy by conversion of solar energy. 4,217,147, Cl. 136-89.0HY.

Zimmer, Johannes. Apparatus for squeegee guidance in screen printer. 4,216,716, Cl. 101-120.000.

Zimmerman, Neil S.: *See*—
Hughes, Donald R.; Gumma, William H.; and Zimmerman, Neil S., 4,217,571, Cl. 367-37.000.

Zimmermann, Volker: *See*—
Matla, Arno; and Zimmermann, Volker, 4,217,612, Cl. 360-78.000.

Zintel, Jakob; and Zipser, Rudolf, to Babcock-Brown Boveri Reaktor GmbH. Hydraulic vibration brake particularly for use in nuclear power plants. 4,216,670, Cl. 73-46.000.

Zipser, Rudolf: *See*—
Zintel, Jakob; and Zipser, Rudolf, 4,216,670, Cl. 73-46.000.

Ziskind, Stanley H. Capsule for photographic use in a walled organ of the living body. 4,217,045, Cl. 354-62.000.

Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 4,217,302, Cl. 260-465.00D.

Zuchner, Werner: *See*—
Straszewski, Klaus; Rauterberg, Jochen; and Zuchner, Werner, 4,217,058, Cl. 401-135.000.

Zuerndorfer, Henry D.: *See*—
Hiller, Edwin R.; Kaplan, Philip D.; Nicosia, Joseph M., Jr.; and Zuerndorfer, Henry D., 4,217,583, Cl. 343-7.700.

Zulauf Inc.: *See*—
Reynolds, James M., 4,216,583, Cl. 433-9.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF AUGUST, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Belokin, Paul, Jr. Power take-off for fluorescent light fixtures. Re. 30,367, Cl. 339-50.00R.

Gabbert, James D.: *See*—
Hedrick, Ross M.; and Gabbert, James D., Re. 30,371, Cl. 528-312.000.

Harris Dynamics: *See*—
Harris, Trevor L., Re. 30,364, Cl. 74-116.000.

Harris, Trevor L., to Harris Dynamics. Variable speed transmission. Re. 30,364, Cl. 74-116.000.

Hedrick, Ross M.; and Gabbert, James D., to Monsanto Company. Catalytic process for imide-alcohol condensation. Re. 30,371, Cl. 528-312.000.

Hruza, Denis E.: *See*—
Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., Re. 30,370, Cl. 426-535.000.

International Flavors & Fragrances Inc.: *See*—
Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., Re. 30,370, Cl. 426-535.000.

Katz, Ira: *See*—
Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., Re. 30,370, Cl. 426-535.000.

Loshaek, Samuel; and Shen, Chah M., to Wesley-Jessen Inc. Gas-permeable lens. Re. 30,368, Cl. 351-160.00H.

Mattler, Martin. Disposable catheter. Re. 30,365, Cl. 128-349.00B.

Midcon Pipeline Equipment Co.: *See*—
Wilson, Daniel F., Re. 30,369, Cl. 156-392.000.

Monsanto Company: *See*—
Hedrick, Ross M.; and Gabbert, James D., Re. 30,371, Cl. 528-312.000.

Mussinan, Cynthia J.: *See*—
Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., Re. 30,370, Cl. 426-535.000.

Pascale, John V.: *See*—
Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., Re. 30,370, Cl. 426-535.000.

Pittet, Alan O.; Hruza, Denis E.; Katz, Ira; Mussinan, Cynthia J.; and Pascale, John V., to International Flavors & Fragrances Inc. Flavoring foodstuffs with a thioester. Re. 30,370, Cl. 426-535.000.

Rasor Associates, Inc.: *See*—
Rasor, Ned S.; and Spickler, Joseph W., Re. 30,366, Cl. 128-419.00P.

Rasor, Ned S.; and Spickler, Joseph W., to Rasor Associates, Inc. Organ stimulator. Re. 30,366, Cl. 128-419.00P.

Shen, Chah M.: *See*—
Loshaek, Samuel; and Shen, Chah M., Re. 30,368, Cl. 351-160.00H.

Spickler, Joseph W.: *See*—
Rasor, Ned S.; and Spickler, Joseph W., Re. 30,366, Cl. 128-419.00P.

Wesley-Jessen Inc.: *See*—
Loshaek, Samuel; and Shen, Chah M., Re. 30,368, Cl. 351-160.00H.

Wilson, Daniel F., to Midcon Pipeline Equipment Co. Pipe wrapping apparatus. Re. 30,369, Cl. 156-392.000.

LIST OF PLANT PATENTEES

Perlberg, Carl R. Apple tree (Ace strain). 4,587, 8-12-80, Cl. 35.000.

LIST OF DESIGN PATENTEES

American Seating Company: *See*—
Barecki, Chester J., 256,298, Cl. D6-48.000.

Annis, James M. Beer keg pallet. 256,346, 8-12-80, Cl. D12-53.000.

Associated Leisure Games Limited: *See*—
Wilcox, David R., 256,358, Cl. D14-15.000.

Ball Corporation: *See*—
Campbell, Arlin L.; and Cannon, Roger B., 256,333, Cl. D9-216.000.

Barecki, Chester J., to American Seating Company. Seat for transportation vehicles. 256,298, 8-12-80, Cl. D6-48.000.

Barr, Josef J. Cross. 256,399, 8-12-80, Cl. D99-27.000.

Beall, Lester. Convertible table. 256,296, 8-12-80, Cl. D6-40.000.

Becker, Marty J. Foil dispenser. 256,330, 8-12-80, Cl. D8-358.000.

Beckman Instruments, Inc.: *See*—
Haunold, Otto; and Frank, Edgar H., 256,341, Cl. D10-81.000.

Bennett, R. Brian P.: *See*—
Crooks, Basil D.; and Bennett, R. Brian P., 256,325, Cl. D8-30.000.

Bergland, Harry G. Sprinkler shield. 256,386, 8-12-80, Cl. D23-7.000.

Blackstone Manufacturing Co., Inc.: *See*—
Weiler, Raywood C., 256,345, Cl. D12-202.000.

Boldt, Melvin H., to Rowe International, Inc. Phonograph. 256,357, 8-12-80, Cl. D14-15.000.

Bolen, Bruce J., to Norlin Industries, Inc. Guitar or similar article. 256,367, 8-12-80, Cl. D17-14.000.

Bolen, Bruce J., to Norlin Industries, Inc. Guitar or similar article. 256,368, 8-12-80, Cl. D17-14.000.

Bunker Ramo Corporation: *See*—
Coppola, John; and Ottersen, William A., 256,371, Cl. D18-13.000.

Caine, Merwin A. Self-closing exhaust fan cover. 256,389, 8-12-80, Cl. D23-151.000.

Campbell, Arlin L.; and Cannon, Roger B., to Ball Corporation. Beverage container. 256,333, 8-12-80, Cl. D9-216.000.

Cannon, Roger B.: *See*—
Campbell, Arlin L.; and Cannon, Roger B., 256,333, Cl. D9-216.000.

Cave, Michael H.: *See*—
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., 256,393, Cl. D24-41.000.
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., 256,394, Cl. D24-41.000.

Chapman, David, to Gerbert Products Company. Electrically heated baby food dish. 256,313, 8-12-80, Cl. D7-69.000.

Chu, David Y. Writing instrument. 256,372, 8-12-80, Cl. D19-42.000.

Clanton, W. Porter, to Quaker Oats Company, The. Toy school building. 256,383, 8-12-80, Cl. D21-114.000.

Clark Equipment Company: *See*—
Kuhn, Patrick, 256,364, Cl. D15-30.000.

Coffey, Wayne E. Twin headed box wrench. 256,324, 8-12-80, Cl. D8-28.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; and Ishii, Yoshiyasu, 256,382, Cl. D21-65.000.

Coppola, John; and Ottersen, William A., to Bunker Ramo Corporation. Validator printer housing. 256,371, 8-12-80, Cl. D18-13.000.

Cornelius Company, The: *See*—
MacKrell, William B., 256,376, Cl. D20-4.000.
MacKrell, William B., 256,377, Cl. D20-8.000.

Cory, Thornton E.: *See*—
Derryberry, Gene; and Cory, Thornton E., 256,337, Cl. D10-69.000.

Cox, Morris E. Wrist band pen holder. 256,292, 8-12-80, Cl. D2-402.000.

Crooks, Basil D.; and Bennett, R. Brian P., to Northern Telecom Limited. Hand held welding tool. 256,325, 8-12-80, Cl. D8-30.000.

Cutts, Patrick. Movable shelf divider. 256,301, 8-12-80, Cl. D6-85.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Combined food storage and serving cup or the like. 256,310, 8-12-80, Cl. D7-23.000.

Daenen, Robert H. C. M., to Dart Industries Inc. Measuring spoon or the like. 256,311, 8-12-80, Cl. D7-50.000.

Dart Industries Inc.: *See*—
Daenen, Robert H. C. M., 256,310, Cl. D7-23.000.
Daenen, Robert H. C. M., 256,311, Cl. D7-50.000.

Derryberry, Gene; and Cory, Thornton E. Level. 256,337, 8-12-80, Cl. D10-69.000.
Dworsky, Alan L. Synthesizer or similar article. 256,366, 8-12-80, Cl. D17-1.000.
Edwards, Harry M. Rain cover for a golf bag. 256,293, 8-12-80, Cl. D3-37.000.
Ernest, Robert O.; and Steinkamp, Norman A., to Sunbeam Corporation. Combined cooking and heating vessel. 256,312, 8-12-80, Cl. D7-64.000.
Ernest, Robert O.; Thomas, Richard K.; and Guth, Gordon T., to Sunbeam Corporation. Stand for a mixer. 256,319, 8-12-80, Cl. D7-160.000.
Eskew, John H., Jr. Boiled-egg dipper. 256,315, 8-12-80, Cl. D7-103.000.
Evans, David M., to S&C Electric Company. Housing for electrical apparatus. 256,352, 8-12-80, Cl. D13-11.000.
Evans, David M., to S&C Electric Company. Base-mounted high voltage circuit interrupter. 256,353, 8-12-80, Cl. D13-11.000.
Evans, David M.; and Ramos, Joel A., to S&C Electric Company. Molded insulating base for an electrical apparatus. 256,355, 8-12-80, Cl. D13-17.000.
Ewig, John F., Jr.; and Gardner, Jon S., to Parker Manufacturing Company. Riveter. 256,327, 8-12-80, Cl. D8-51.000.
Fairchild Industries, Inc.: *See*—
McComas, Jean, 256,347, Cl. D12-71.000.
Fellhauer, Lee E. Hair spray face shield. 256,396, 8-12-80, Cl. D28-9.000.
Fields, Robert. Jump rope. 256,385, 8-12-80, Cl. D21-191.000.
Fontaine, Jean F. L.; Hitzky, Leon J.; and Jablonski, Jan E., to Goodyear Tire & Rubber Company, The. Tire. 256,349, 8-12-80, Cl. D12-146.000.
Fostoria Glass Company: *See*—
Saffell, Jon R., 256,309, Cl. D7-11.000.
Frank, Edgar H.: *See*—
Haunold, Otto; and Frank, Edgar H., 256,341, Cl. D10-81.000.
Frank, Edith. Wall unit. 256,307, 8-12-80, Cl. D6-186.000.
Fratarcangeli, Victor J., to Quaker Oats Company, The. Toy service building. 256,384, 8-12-80, Cl. D21-118.000.
Fresard, Marcel, to Mefina S.A. Sewing machine. 256,365, 8-12-80, Cl. D15-70.000.
Galloway, Donald W. Panel truck body. 256,348, 8-12-80, Cl. D12-96.000.
Gard, Eric A., to Pennsylvania Scale Company. Counting scale. 256,342, 8-12-80, Cl. D10-91.000.
Gard, Eric A., to Pennsylvania Scale Company. Counting scale. 256,343, 8-12-80, Cl. D10-91.000.
Gardner, Jon S.: *See*—
Ewig, John F., Jr.; and Gardner, Jon S., 256,327, Cl. D8-51.000.
General Electric Company: *See*—
Schindler, Donald R.; and Soules, Thomas F., 256,397, Cl. D26-2.000.
Gera, Mary Ann: *See*—
Gera, Robert A.; and Gera, Mary Ann, 256,297, Cl. D6-46.000.
Gera, Robert A.; and Gera, Mary Ann, to Kroehler Mfg. Co. Combined sectional seat and table unit. 256,297, 8-12-80, Cl. D6-46.000.
Gerber, Eugene; and Zaret, Sol. Paper binding. 256,374, 8-12-80, Cl. D19-65.000.
Gerbert Products Company: *See*—
Chapman, David, 256,313, Cl. D7-69.000.
Gerity Products, Incorporated: *See*—
Murtagh, William O., 256,326, Cl. D8-50.000.
Murtagh, William O., 256,329, Cl. D8-103.000.
Gindek, Joanne L.; and Messina, Joseph R., to Revlon, Inc. Bottle. 256,331, 8-12-80, Cl. D9-71.000.
Goodyear Tire & Rubber Company, The: *See*—
Fontaine, Jean F. L.; Hitzky, Leon J.; and Jablonski, Jan E., 256,349, Cl. D12-146.000.
Great Lakes Pressed Steel Corporation: *See*—
Nichols, Robert M., Jr., 256,316, Cl. D7-107.000.
Guth, Gordon T.: *See*—
Ernest, Robert O.; Thomas, Richard K.; and Guth, Gordon T., 256,319, Cl. D7-160.000.
Hamada, Masanori: *See*—
Nishimoto, Teruyuki; Hamada, Masanori; and Mishiro, Benito, 256,360, Cl. D14-70.000.
Taguchi, Shuhei; Nishimoto, Teruyuki; Hamada, Masanori; Mishiro, Benito; and Ohta, Kikuo, 256,362, Cl. D14-70.000.
Harrell, Robert L. Cylindrical evaporative cooler. 256,388, 8-12-80, Cl. D23-139.000.
Harwood, Katherine L. Spinning push toy. 256,381, 8-12-80, Cl. D21-64.000.
Haunold, Otto; and Frank, Edgar H., to Beckman Instruments, Inc. Photometer. 256,341, 8-12-80, Cl. D10-81.000.
Hay, David R. Bench for use in meditation. 256,295, 8-12-80, Cl. D6-2.000.
Hitzky, Leon J.: *See*—
Fontaine, Jean F. L.; Hitzky, Leon J.; and Jablonski, Jan E., 256,349, Cl. D12-146.000.
Honeywell Inc.: *See*—
Odom, James A.; Pasquarette, Ralph E.; and Wolfe, Norbert T., 256,336, Cl. D10-51.000.
Pasquarette, Ralph E., 256,335, Cl. D10-50.000.
Hughes, Thomas E.: *See*—
Kester, Charles E.; and Hughes, Thomas E., 256,338, Cl. D10-70.000.
Ichikawa, Shinpei; and Welch, Robert A., to Texas Instruments Incorporated. Case for hand-held electronic calculator. 256,370, 8-12-80, Cl. D18-7.000.
International Playtex, Inc.: *See*—
Stern, Harold; and Raimondi, Phyllis, 256,288, Cl. D2-24.000.
Ishii, Yoshiyasu: *See*—
Nakao, Shinroku; and Ishii, Yoshiyasu, 256,382, Cl. D21-65.000.
Jablonski, Jan E.: *See*—
Fontaine, Jean F. L.; Hitzky, Leon J.; and Jablonski, Jan E., 256,349, Cl. D12-146.000.
Johnson, Jerry L., to Landes Manufacturing Company. Collapsible drawer unit. 256,305, 8-12-80, Cl. D6-165.000.
Johnson, Sidney W. Portable mounting stand for ammunition handloading press. 256,328, 8-12-80, Cl. D8-71.000.
Kannas, Ronald N.: *See*—
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., 256,393, Cl. D24-41.000.
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., 256,394, Cl. D24-41.000.
Kawano, Takeyoshi: *See*—
Mishiro, Benito; Nishimoto, Teruyuki; Murakami, Shinzo; and Kawano, Takeyoshi, 256,361, Cl. D14-70.000.
Kelsey Hayes Co: *See*—
Main, John A., 256,350, Cl. D12-209.000.
Kester, Charles E.; and Hughes, Thomas E., to Ranging, Inc. Range finder. 256,338, 8-12-80, Cl. D10-70.000.
Konishi, Tadashi, to Mitutoyo Manufacturing Company, Ltd. Micrometer. 256,339, 8-12-80, Cl. D10-73.000.
Kroehler Mfg. Co.: *See*—
Gera, Robert A.; and Gera, Mary Ann, 256,297, Cl. D6-46.000.
Kuhn, Patrick, to Clark Equipment Company. Combined tractor cab and hood unit. 256,364, 8-12-80, Cl. D15-30.000.
Land, Elvert H., Jr. Toilet seat. 256,387, 8-12-80, Cl. D23-71.000.
Landes Manufacturing Company: *See*—
Johnson, Jerry L., 256,305, Cl. D6-165.000.
Lazerson, Jay A. Electrical plug sealer. 256,356, 8-12-80, Cl. D13-99.000.
Leach, Russell B. Violin. 256,369, 8-12-80, Cl. D17-17.000.
Levin, Monte L. Food processor. 256,318, 8-12-80, Cl. D7-154.000.
Llanos, Leon A. Illuminable pocket note pad holder. 256,375, 8-12-80, Cl. D19-75.000.
MacCready, Willis, to Michigan Seat Company. Vehicle seat. 256,299, 8-12-80, Cl. D6-48.000.
MacKrell, William B., to Cornelius Company, The. Beverage dispensing machine. 256,376, 8-12-80, Cl. D20-4.000.
MacKrell, William B., to Cornelius Company, The. Cup filling compartment for a beverage dispensing machine. 256,377, 8-12-80, Cl. D20-8.000.
Main, John A., to Kelsey Hayes Co. Trim ring for vehicle wheel. 256,350, 8-12-80, Cl. D12-209.000.
Mancarella, Anthony. Fireplace screen. 256,321, 8-12-80, Cl. D7-208.000.
Marks, Gerald. Colon model. 256,373, 8-12-80, Cl. D19-62.000.
Marquart, Daniel M., Sr. Knife for filleting fish. 256,317, 8-12-80, Cl. D7-149.000.
Marx, Arthur A. Display device for spectacles. 256,304, 8-12-80, Cl. D6-157.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Mishiro, Benito; Nishimoto, Teruyuki; Murakami, Shinzo; and Kawano, Takeyoshi, 256,361, Cl. D14-70.000.
Nishimoto, Teruyuki; Hamada, Masanori; and Mishiro, Benito, 256,360, Cl. D14-70.000.
Taguchi, Shuhei; and Okada, Takao, 256,359, Cl. D14-70.000.
Taguchi, Shuhei; Nishimoto, Teruyuki; Hamada, Masanori; Mishiro, Benito; and Ohta, Kikuo, 256,362, Cl. D14-70.000.
McComas, Jean, to Fairchild Industries, Inc. Aircraft. 256,347, 8-12-80, Cl. D12-71.000.
McLelland, Lynn. Cake mitt. 256,291, 8-12-80, Cl. D2-364.000.
Mefina S.A.: *See*—
Fresard, Marcel, 256,365, Cl. D15-70.000.
Meis, William J. Cleaning tool for removing paint or the like from grinder disks. 256,320, 8-12-80, Cl. D7-185.000.
Messina, Joseph R., to Revlon, Inc. Bottle. 256,332, 8-12-80, Cl. D9-145.000.
Messina, Joseph R.: *See*—
Gindek, Joanne L.; and Messina, Joseph R., 256,331, Cl. D9-71.000.
Michigan Seat Company: *See*—
MacCready, Willis, 256,299, Cl. D6-48.000.
Miklos, Andrew. Breakfront or similar article. 256,306, 8-12-80, Cl. D6-172.000.
Minit-Lube, Inc.: *See*—
Titus, Richard G., 256,395, Cl. D25-22.000.
Mishiro, Benito; Nishimoto, Teruyuki; Murakami, Shinzo; and Kawano, Takeyoshi, to Matsushita Electric Industrial Co., Ltd. Radio receiver. 256,361, 8-12-80, Cl. D14-70.000.
Mishiro, Benito: *See*—
Nishimoto, Teruyuki; Hamada, Masanori; and Mishiro, Benito, 256,360, Cl. D14-70.000.
Taguchi, Shuhei; Nishimoto, Teruyuki; Hamada, Masanori; Mishiro, Benito; and Ohta, Kikuo, 256,362, Cl. D14-70.000.
Mitchell, Hugh E. Statue. 256,398, 8-12-80, Cl. D99-25.000.
Mitutoyo Manufacturing Company, Ltd.: *See*—
Konishi, Tadashi, 256,339, Cl. D10-73.000.
Moore, William W., Sr. Rack for football equipment. 256,302, 8-12-80, Cl. D6-114.000.

Morin, Andre. Combined butter tray and cover. 256,314, 8-12-80, Cl. D7-84.000.
Murakami, Shinzo: *See*—
Mishiro, Benito; Nishimoto, Teruyuki; Murakami, Shinzo; and Kawano, Takeyoshi, 256,361, Cl. D14-70.000.
Murtagh, William O., to Gerity Products, Incorporated. Stapler. 256,326, 8-12-80, Cl. D8-50.000.
Murtagh, William O., to Gerity Products, Incorporated. Letter opener. 256,329, 8-12-80, Cl. D8-103.000.
Nakao, Shinroku; and Ishii, Yoshiyasu, to Combi Co., Ltd. Combined whistle, dial and rattle. 256,382, 8-12-80, Cl. D21-65.000.
Nichols, Robert M., Jr., to Great Lakes Pressed Steel Corporation. Foldaway grill. 256,316, 8-12-80, Cl. D7-107.000.
Nishimoto, Teruyuki; Hamada, Masanori; and Mishiro, Benito, to Matsushita Electric Industrial Co., Ltd. Solar battery powered radio receiver. 256,360, 8-12-80, Cl. D14-70.000.
Nishimoto, Teruyuki: *See*—
Mishiro, Benito; Nishimoto, Teruyuki; Murakami, Shinzo; and Kawano, Takeyoshi, 256,361, Cl. D14-70.000.
Taguchi, Shuhei; Nishimoto, Teruyuki; Hamada, Masanori; Mishiro, Benito; and Ohta, Kikuo, 256,362, Cl. D14-70.000.
Norlin Industries, Inc.: *See*—
Bolen, Bruce J., 256,367, Cl. D17-14.000.
Bolen, Bruce J., 256,368, Cl. D17-14.000.
Northern Telecom Limited: *See*—
Crooks, Basil D.; and Bennett, R. Brian P., 256,325, Cl. D8-30.000.
Obland, Donald R. Cap remover. 256,323, 8-12-80, Cl. D8-18.000.
Odom, James A.; Pasquarette, Ralph E.; and Wolfe, Norbert T., to Honeywell Inc. Clock thermostat. 256,336, 8-12-80, Cl. D10-51.000.
Ohta, Kikuo: *See*—
Taguchi, Shuhei; Nishimoto, Teruyuki; Hamada, Masanori; Mishiro, Benito; and Ohta, Kikuo, 256,362, Cl. D14-70.000.
Okada, Takao: *See*—
Taguchi, Shuhei; and Okada, Takao, 256,359, Cl. D14-70.000.
Ottersen, William A.: *See*—
Coppola, John; and Ottersen, William A., 256,371, Cl. D18-13.000.
Parker Manufacturing Company: *See*—
Ewig, John F., Jr.; and Gardner, Jon S., 256,327, Cl. D8-51.000.
Pasquarette, Ralph E., to Honeywell Inc. Clock thermostat. 256,335, 8-12-80, Cl. D10-50.000.
Pasquarette, Ralph E.: *See*—
Odom, James A.; Pasquarette, Ralph E.; and Wolfe, Norbert T., 256,336, Cl. D10-51.000.
Pennsylvania Scale Company: *See*—
Gard, Eric A., 256,342, Cl. D10-91.000.
Gard, Eric A., 256,343, Cl. D10-91.000.
Princeton Industries Corporation: *See*—
Stahel, Alwin J., II, 256,334, Cl. D9-237.000.
Quaker Oats Company, The: *See*—
Clanton, W. Porter, 256,383, Cl. D21-114.000.
Fratarcangeli, Victor J., 256,384, Cl. D21-118.000.
Raimondi, Phyllis: *See*—
Stern, Harold; and Raimondi, Phyllis, 256,288, Cl. D2-24.000.
Ramos, Joel A., to S&C Electric Company. Molded electrical insulator. 256,354, 8-12-80, Cl. D13-17.000.
Ramos, Joel A.: *See*—
Evans, David M.; and Ramos, Joel A., 256,355, Cl. D13-17.000.
Ranging, Inc.: *See*—
Kester, Charles E.; and Hughes, Thomas E., 256,338, Cl. D10-70.000.
Revlon, Inc.: *See*—
Gindek, Joanne L.; and Messina, Joseph R., 256,331, Cl. D9-71.000.
Messina, Joseph R., 256,332, Cl. D9-145.000.
Rieman, Paul F. Caddy for assembled rods and reels. 256,303, 8-12-80, Cl. D6-125.000.
Rowe International, Inc.: *See*—
Boldt, Melvin H., 256,357, Cl. D14-15.000.
Ryder, Francis E.: *See*—
Thomas, Michael D.; and Ryder, Francis E., 256,390, Cl. D24-9.000.
Thomas, Michael D.; and Ryder, Francis E., 256,391, Cl. D24-9.000.
Thomas, Michael D.; and Ryder, Francis E., 256,392, Cl. D24-9.000.
Ryder International Corporation: *See*—
Thomas, Michael D.; and Ryder, Francis E., 256,390, Cl. D24-9.000.
Thomas, Michael D.; and Ryder, Francis E., 256,391, Cl. D24-9.000.
Thomas, Michael D.; and Ryder, Francis E., 256,392, Cl. D24-9.000.
S&C Electric Company: *See*—
Evans, David M., 256,352, Cl. D13-11.000.
Evans, David M., 256,353, Cl. D13-11.000.
Evans, David M.; and Ramos, Joel A., 256,355, Cl. D13-17.000.
Ramos, Joel A., 256,354, Cl. D13-17.000.
Saffell, Jon R., to Fostoria Glass Company. Beverage tumbler. 256,309, 8-12-80, Cl. D7-11.000.
Saitoh, Shigeru. Toy pin-ball machine. 256,378, 8-12-80, Cl. D21-12.000.
Saitoh, Shigeru. Toy pin-ball machine. 256,379, 8-12-80, Cl. D21-12.000.
Saitoh, Shigeru. Toy pin-ball machine. 256,380, 8-12-80, Cl. D21-12.000.
Schindler, Donald R.; and Soules, Thomas F., to General Electric Company. Photoflash lamp unit. 256,397, 8-12-80, Cl. D26-2.000.
Schneck, Stuart B. Hydroponic unit. 256,344, 8-12-80, Cl. D11-156.000.
Schulze, Everett E. Solenoid cylinder frame for reciprocating motor. 256,351, 8-12-80, Cl. D13-1.000.
Solari, Ray L. Sport goggles. 256,290, 8-12-80, Cl. D2-234.000.
Soules, Thomas F.: *See*—
Schindler, Donald R.; and Soules, Thomas F., 256,397, Cl. D26-2.000.
Spohn, Daniel M., Jr. Attachment tool for a straight edge or tape measure for marking or facilitating the marking of straight or arcuate lines. 256,340, 8-12-80, Cl. D10-74.000.
Stahel, Alwin J., II, to Princeton Industries Corporation. Box. 256,334, 8-12-80, Cl. D9-237.000.
Steinkamp, Norman A.: *See*—
Ernest, Robert O.; and Steinkamp, Norman A., 256,312, Cl. D7-64.000.
Stern, Harold; and Raimondi, Phyllis, to International Playtex, Inc. Brassiere. 256,288, 8-12-80, Cl. D2-24.000.
Stimtech, Inc.: *See*—
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., 256,393, Cl. D24-41.000.
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Su, Kim U. Hair brush. 256,294, 8-12-80, Cl. D4-35.000.
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Ernest, Robert O.; and Steinkamp, Norman A., 256,312, Cl. D7-64.000.
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Taguchi, Shuhei; and Okada, Takao, to Matsushita Electric Industrial Co., Ltd. Portable radio. 256,359, 8-12-80, Cl. D14-70.000.
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Texas Instruments Incorporated: *See*—
Ichikawa, Shinpei; and Welch, Robert A., 256,370, Cl. D18-7.000.
Thomas, Michael D.; and Ryder, Francis E., to Ryder International Corporation. Contact lens sterilizer unit. 256,390, 8-12-80, Cl. D24-9.000.
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Thomas, Richard K.: *See*—
Ernest, Robert O.; Thomas, Richard K.; and Guth, Gordon T., 256,319, Cl. D7-160.000.
Titus, Richard G., to Minit-Lube, Inc. Building. 256,395, 8-12-80, Cl. D25-22.000.
Uchiyama, Rikio, to Victor Company of Japan, Limited. Combined radio and television receiver. 256,363, 8-12-80, Cl. D14-72.000.
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Viio, Matti. Workman's vest. 256,289, 8-12-80, Cl. D2-190.000.
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., to Stimtech, Inc. Transcutaneous electrical nerve stimulator pulse generator and power supply. 256,393, 8-12-80, Cl. D24-41.000.
Walus, Richard L.; Kannas, Ronald N.; and Cave, Michael H., to Stimtech, Inc. Transcutaneous electrical nerve stimulator pulse generator and power supply. 256,394, 8-12-80, Cl. D24-41.000.
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Welch, Robert A.: *See*—
Ichikawa, Shinpei; and Welch, Robert A., 256,370, Cl. D18-7.000.
Wilcox, David R., to Associated Leisure Games Limited. Phonograph cabinet. 256,358, 8-12-80, Cl. D14-15.000.
Wolfe, Norbert T.: *See*—
Odom, James A.; Pasquarette, Ralph E.; and Wolfe, Norbert T., 256,336, Cl. D10-51.000.
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Zimmermann, Joerg, 256,308, Cl. D7-1.000.
Yoshimura, Junzo. Chair. 256,300, 8-12-80, Cl. D6-73.000.
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Gerber, Eugene; and Zaret, Sol, 256,374, Cl. D19-65.000.
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CLASSIFICATION OF PATENTS

ISSUED AUGUST 12, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

22 4,216,547

CLASS 3

1.91 4,216,548
1.911 4,216,549
15 4,216,550

CLASS 4

300 4,216,553
323 4,216,554
324 4,216,555
521 4,216,551
548 4,216,552

CLASS 5

82 R 4,216,556

CLASS 6

10 4,216,557

CLASS 8

66 4,217,103
94.14 4,217,104
111 4,217,105
127 4,217,106
662 4,217,102

CLASS 9

1.1 4,216,558
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CLASS 13

10 4,217,462

CLASS 15

21 D 4,216,560
104.3 R 4,216,561
119 A 4,216,562
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CLASS 16

93 D 4,216,564

CLASS 17

1 G 4,216,565
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CLASS 23

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230 PC 4,217,108

CLASS 24

81 J 4,216,567
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CLASS 29

157.3 C 4,216,569
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578 4,216,574
596 4,216,571
597 4,216,575
730 4,216,579
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842 4,216,580
845 4,216,576
857 4,216,578

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133 4,216,581
216 4,216,582

CLASS 33

143 L 4,216,584
169 B 4,216,585
178 B 4,216,586
180 R 4,216,587
189 4,216,588
266 4,216,589
304 4,216,590

CLASS 34

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CLASS 35

10 4,216,593
22 R 4,216,594

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CLASS 40

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CLASS 42

1 B 4,216,601
1 ST 4,216,600

CLASS 43

18 R 4,216,602
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25.2 4,216,604
42.53 4,216,605
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CLASS 44

1 SR 4,217,109
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71 4,217,111

CLASS 46

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74 D 4,216,611
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58 4,216,616
62 4,216,617
65 4,216,618
67 4,216,619
71 4,216,622
72 4,216,620
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CLASS 49

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CLASS 51

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309.9 4,216,634
481 4,216,635
637 4,216,636
718 4,216,637

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95 4,217,115
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351 4,217,119
385 R 4,217,120
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480 4,217,122

CLASS 56

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320.1 4,216,643

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58.89 4,216,644
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CLASS 60

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311 4,216,654
398 4,216,655
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641 4,216,657
740 4,216,651
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186 4,216,659
238 4,216,660
505 4,216,661

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99 A 4,217,125
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CLASS 66

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CLASS 68

3 R 4,216,663

CLASS 70

39 4,216,664
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CLASS 71

28 4,217,127
29 4,217,128
76 4,217,129
95 4,217,130
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CLASS 72

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366 4,216,667
412 4,216,668

CLASS 73

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61 R 4,216,671
115 4,216,672
362 AR 4,216,675
432 R 4,216,676
861 4,216,673
861.01 4,216,674

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17.8 4,216,677
116 Re.30,364
473 R 4,216,680
571 M 4,216,681
579 E 4,216,682
688 4,216,683
751 4,216,684

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58 4,217,133
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123 L 4,217,135
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165 4,217,137
170 4,217,138
206 4,217,139
214 4,217,140
244 4,217,141

CLASS 81

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CLASS 82

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CLASS 83

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77 4,216,689
114 4,216,690

CLASS 84

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1.03 4,216,693
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421 4,216,695
422 R 4,216,696

CLASS 85

70 4,216,697

CLASS 89

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CLASS 91

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49 4,216,701
170 R 4,216,700
436 4,216,702

CLASS 92

63 4,216,703
78 4,216,704

CLASS 93

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77 FT 4,216,706

CLASS 98

2 4,216,707
36 4,216,708
58 4,216,709
115 R 4,216,710

CLASS 99

277.2 4,216,711
565 4,216,712

CLASS 100

209 4,216,713

CLASS 101

40 4,216,714
103 4,216,715
120 4,216,716
123 4,216,717
144 4,216,718
227 4,216,719

CLASS 102

67 4,216,720
90 4,216,721
91 4,216,722
223 4,216,723

CLASS 104

258 4,216,724

CLASS 105

348 4,216,725

CLASS 106

14.36 4,217,142
100 4,217,143
104 4,217,144
170 4,217,145
285 4,217,146

CLASS 108

20 4,216,727
44 4,216,728
159 4,216,729

CLASS 111

69 4,216,730

CLASS 112

158 B 4,216,731
4,216,732
184 4,216,733
320 4,216,734
410 4,216,735

CLASS 113

121 C 4,216,736

CLASS 118

72 4,216,738
216 4,216,739
681 4,216,740

CLASS 119

15 4,216,741
18 4,216,742
19 4,216,743

CLASS 123

1 A 4,216,744
26 4,216,745
41.69 4,216,746
51 BA 4,216,747
179 L 4,216,757
198 F 4,216,758
253 4,216,748
408 4,216,749
435 4,216,750
445 4,216,753
447 4,216,754
499 4,216,752
523 4,216,751
597 4,216,756
643 4,216,755

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120 4,216,760
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275 R 4,216,763
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207.13 4,216,769
214 R 4,216,770
218 P 4,216,771
284 4,216,772
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296 4,216,774
303.18 4,216,775
305 4,216,776
330 4,216,777
349 B Re.30,365
419 P Re.30,366
581 4,216,778
682 4,216,779
699 4,216,780
731 4,216,781
764 4,216,782
773 4,216,766
778 4,216,783

CLASS 131

17 R 4,216,784
173 4,216,785
180 4,216,786

CLASS 132

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CLASS 133

8 R 4,216,788

CLASS 136

89 HY 4,217,147
89 SJ 4,217,148
232 4,217,463

CLASS 137

78 D 4,216,789
199 4,216,791
209 4,216,792
318 4,216,793
322 4,216,794
357 4,216,790
554 4,216,795
571 4,216,796
596.13 4,216,797
625.29 4,216,798
625.66 4,216,799
807 4,216,800

CLASS 138

121 4,216,801
143 4,216,802
144 4,216,803

CLASS 139

311 4,216,804
384 B 4,216,805

CLASS 140

92.1 4,216,806

CLASS 141

392 4,216,807

CLASS 145

29 R 4,216,808

CLASS 148

1.5 4,217,149
2 4,217,150
31.55 4,217,151
108 4,217,152
187 4,217,153
189 4,217,154

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158 4,216,809
4,216,810
213 A 4,216,811
330 L 4,216,812
361 DM 4,216,813
362 R 4,216,814

CLASS 156

55 4,217,155
69 4,217,156
87 4,217,157
156 4,217,158
177 4,217,159
239 4,217,160
242 4,217,161
305 4,217,162
361 4,217,163
392 Re.30,369
466 4,216,638
541 4,217,164
601 4,217,165
605 4,217,166
624 4,217,167

CLASS 162

100 4,217,169
380 4,217,170

CLASS 164

26 4,216,815
54 4,216,816
147 4,216,817
443 4,216,818

CLASS 165

1 4,216,819
4,216,820
11 R 4,216,821
42 4,216,822
55 4,216,823
69 4,216,824
109 R 4,216,825
133 4,216,826

CLASS 166

120 4,216,827
274 4,216,828
276 4,216,829
319 4,216,830

CLASS 172

380 4,216,831
540 4,216,832
805 4,216,833

CLASS 174

79 4,217,464
138 F 4,217,465
209 4,217,466

CLASS 175

7 4,216,834
10 4,216,835
66 4,216,836

CLASS 176

7 4,217,171
9 4,217,172
19 LD 4,217,173
82 4,217,174

CLASS 177

1 4,216,837

CLASS 178

67.1 4,217,467
116 4,217,468

CLASS 179

1.5 R 4,217,469

CLASS 180

14 R 4,216,838
65 R 4,216,839
70 R 4,216,840
141 4,216,841
146 4,216,842
245 4,216,843

CLASS 182

104 4,216,844

CLASS 186

49 4,216,845

CLASS 187

1 R 4,216,846
9 R 4,216,847

CLASS 188

71.2 4,216,848
138 4,216,849
216 4,216,850

CLASS 192

4 A 4,216,851
85 AA 4,216,852

CLASS 193

32 4,216,853

CLASS 198

481 4,216,854
633 4,216,855
847 4,216,856

CLASS 200

19 R 4,217,470
81.9 R 4,217,471
144 R 4,217,472
159 B 4,217,473
335 4,217,474

CLASS 202

118 4,217,175
173 4,217,176
248 4,217,177

CLASS 203

19 4,217,178

CLASS 204

1 T 4,217,179
4,217,180
1.5 4,217,181
15 4,217,182
4,217,183
59 QM 4,217,184
73 R 4,217,185
98 4,217,186
4,217,187
109 4,217,188
119 4,217,189
129.35 4,217,190
130 4,217,191
149 4,217,192
180 G 4,217,193
192 SP 4,217,194
195 B 4,217,196
195 F 4,217,195
243 R 4,217,197
252 4,217,198
256 4,217,199
301 4,217,200

CLASS 206

1.5 4,216,857
45.15 4,216,858
159 4,216,859
370 4,216,860
427 4,216,861
541 4,216,862
554 4,216,863
622 4,216,864

CLASS 208

8 R 4,217,201
11 LE 4,217,202
35 4,217,203
125 4,217,204
139 4,217,205
251 H 4,217,206

CLASS 209

13 4,217,207
18 4,217,208
539 4,216,865

CLASS 210

7 4,217,211
19 4,217,212
28 4,217,210
42 S 4,217,213
52 4,217,214
53 4,217,209
54 4,217,215
58 4,217,216
59 4,217,217
63 R 4,217,218
65 4,217,219
79 4,217,220
168 4,217,221
177 4,217,222
198 C 4,217,223
231 4,217,224
236 4,217,225
376 4,217,226
500 M 4,217,227

CLASS 211

1.5 4,216,866
77 4,216,867

CLASS 212

155 4,216,868
165 4,216,869
223 4,216,870

CLASS 213

211 4,216,871

CLASS 215

253 4,216,872

CLASS 219

10.51 4,217,475
10.55 B 4,217,477
10.55 E 4,217,476
97 4,217,478
121 P 4,217,479
216 4,217,480
450 4,217,481
494 4,217,482
541 4,217,483

CLASS 220

4 R 4,216,873
5 A 4,216,874
212 4,216,875
319 4,216,876

CLASS 221

213 4,216,877
264 4,216,878

CLASS 222

1 4,216,879
83 4,216,880
94 4,216,881
207 4,216,882
321 4,216,883
402.16 4,216,884
481 4,216,885
595 4,216,886

CLASS 224

310 4,216,887

CLASS 226

104 4,216,888
118 4,216,889

CLASS 227

22 4,216,890
30 4,216,891

CLASS 228

44.1 R 4,216,892
45 4,216,893
52 4,216,894
178 4,216,895
212 4,216,896

CLASS 229

35 4,216,897
44 CB 4,216,898
54 R 4,216,899
55 4,216,900

CLASS 232

1 D 4,216,901

CLASS 235

92 DN 4,217,484
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468 4,217,487

CLASS 236

42 4,216,902

CLASS 237

8 R 4,216,903

CLASS 238

25 4,216,904
349 4,216,905

CLASS 239

11 4,216,906
127 4,216,907
132.3 4,216,908
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526 4,216,911
533.4 4,216,912
594 4,216,913
666 4,216,914
698 4,216,915

CLASS 241

36 4,216,916
37.5 4,216,917
46 B 4,216,918
92 4,216,919

CLASS 242

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445 T 4,217,499
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65 4,216,938

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429 B 4,217,245
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431 C 4,217,247
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522 R 4,217,250
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CLASS 254

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310 4,216,942
326 4,216,941
390 4,216,940

CLASS 256

10 4,216,943

CLASS 260

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18 N 4,217,256
22 CB 4,217,257
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